



## NEWS IN BRIEF

## ANSI Cobol for Criterions

THE long-promised ANSI 1974 Cobol compiler for the NCR Criterion machines has been released in the US, and should be arriving in the UK early next year. The compiler was originally announced with the Criterion (CW, April 22, 1970), and scheduled for worldwide release about now.

An NCR spokesman admitted that release had been delayed but declined to give any reasons.

## Zilog marketing

EUROPEAN marketing responsibilities at Zilog have been taken over temporarily by Bob Sums, vice-president of marketing for the company, following the death of Vic Yates (CW, November 3). Sums will operate from Zilog's European headquarters at Maidenhead, from the end of November.

## Mididisc

AN ultra-compact disc subsystem for the desk-top systems builder has been introduced to the UK market by CII-Honeywell Bull. Developed to produce a disc unit comparable in size to the compact processors now available, it is called the Mididisc and will be available in 10 and 20 Megabyte units.

## Luck of the draw

DELIVERIES of IBM's 3031 and 3032 processors are to be scheduled by the luck of the draw in the same way as 3033 deliveries (CW, June 23). Among the customers "going into the hat" will be Derbyshire County Council, which wants a 3031 to replace its 370/145.

## Cutting costs

THE National Office Reprographic Exhibition will take place from February 14-16 at the Wembley Conference Centre. It is organised by the Business Equipment Trade Association. Aim of the conference is to help the business world cut costs in all departments. Further details from BETA on 01-405 6233.

Harris also said that in moving on to a more powerful system, the company was carrying out a decision made some time ago.

"About three years ago we would have liked to jump in and buy such equipment, but the

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## COMPUTERVIEW

# Software conversion is a costly business

SINCE ICL announced its DME operating systems on the 2900 earlier this year, its 2900 orders have doubled. And the success of DME is not that it is a 2900 operating system, but that it makes the 2900 look like an ICL 1900 or System 4.

At Vickers for example (see page 3), a 2900 is replacing a 1903T. But although the 2900 was commissioned last week, it will be at least two years before it runs fully in genuine "native" 2900 mode. In the meantime it will be running under George 3 DME, giving about a 35% throughput compared to the 1903T and operating like a 1900 George 3 system.

It took ICL a long time on the 2900 to realise two obvious facts of user life: that the cost of conversion is of major significance in choosing new systems, and that a major way of keeping an existing customer base is to provide better conversion aids to new systems than the competition.

DME was announced earlier this year (CW, April 21), over 2 years after the 2900 was announced.

Before DME, ICL offered — as it still does — microprogrammed emulation packages running under the 2900 VME operating systems.

But these do not really provide the efficiency needed by users such as Vickers, which requires increased capabilities and reliable live running during the transition from one system to another.

DME was not part of ICL's original 2900 plans, but was developed following strong pressure from existing users and, therefore, from the ICL sales force.

As Fred Lamond pointed out last week in Computer Weekly, ICL has now learnt its lesson, with DME playing a crucial role in the 2900 "swing" computer, which swings into the gap between the 24-bit 2003 and small 1900 systems and the 32-bit larger 2900 machines, giving a smooth transition before swinging into native 2900 mode.

The danger of the DME approach, as one wit has succinctly put it, is that emulation is like masturbation — once you get

used to it you begin to think it is the real thing.

The importance of software conversion costs was highlighted recently by a report which calculated that the American government spends over \$450 million a year on software conversion — and that at least a quarter of that could be saved by more efficient software conversion practices (CW, November 10).

The report was produced by the General Accounting Office, GAO, which is the US federal government's auditing bureau.

One of the GAO's conclusions was that the government should establish a federal software conversion centre which would recognise that software conversion is an expertise in its own right, requiring skilled and experienced personnel for systems evaluation and conversion implementation.

The GAO has followed up this report with some rerecommendations on how to ease the transition from one type of hardware to another.

Advice includes looking through software and data to decide whether any of it can be thrown away; whether rewriting some programs is better than trying to convert them; whether there are any suitable outside contractors who could implement at least part of the project — and other common sense advice which so often characterises any general guidelines but which is so often ignored in practice.

In the helter skelter of technological progress, it is often forgotten that the real user world evolves at a more conservative and leisurely pace. Gene Amdahl once described his belief that IBM would never provide any radically new system that was incompatible with

## INTERRUPT...

IT had been a long dinner and the data processing manager was wondering how on earth he was going to get up in time for that 08.00 meeting with his vice president. Still, the computer

centre was only just slightly out of his way home and it was good for his image just to drop in and make sure the night shift were not having any problems with the payroll suite, after last month's fiasco.

Turning into the car park he looked twice at the computer room windows, blinked, and wondered if he should have had that last brandy. For there, at the far end near the paper store, was a new piece of equipment he had never seen before. It was box shaped and IBM blue.

Walking into reception he could see a flurry of activity in the computer room through the security doors which should have been closed — but were not. He made a mental note to see the operations manager about that the next morning.

Then he realised that there was in fact no new equipment. But standing at the far end of the computer room, next to a carefully stacked pile of floor tiles, was a mini car with bonnet up. Underneath could be seen one end of the night shift leader carefully wedged in the space below the raised floor.

The moral of this story is one of the most frequently ignored fundamentals of working in DP — "when it's time to go home, it's time to go home."

Submitted by Ian A. Riddle of Enfield, Middlesex, who wins the weekly £5 interrupt prize.

existing systems by saying "Users want to reach Nirvana through the gradual evolutionary methods of the Buddhists and not through the painful Christian way of having to die before entering heaven."

This evolutionary approach should not be top of the priority list in the design of any new system because user investment in software systems is now so enormous that any other approach is bound to fail.

It is likely, for example, that the new IBM E-series, which eventually will replace the 370 range, will emerge slowly, over a period of time, and will consist of a range of processor and controller options, with associated software and networking capabilities, rather than be announced suddenly as "a new range."

In the ever-changing, microprocessing, distributed intelligent, supersleek-selling seventies, it is comforting to know that the stabilising sensibility of the user exists to bring computer manufacturers down to earth.

## FOCUS

### Ten years ago...

COMPUTER WEEKLY

NOVEMBER 23, 1967

THE corporate structure

IBM acquired a new four-man management committee standing behind the highest level of executive and operational executives, preparation for the formation of specialised divisions within the company, and funds towards avoiding any user trust action, were suggested as reasons ... The Smithsonian Institution, Washington, was doing research for the first complete computer history.

CL's second Type 40 computer was ordered by the Dutch Shell ... The Foreign Office advertised for a deputy director for the National Giro, at £4,000.

on the exhibition

survival kit

for those intent on covering

such exhibitions, Focus now

presents its survival kit.

Item one would be a good

kit. The IBM was certainly

for the number of comp-

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plus the fact that there

to be more model girls,

than related comput-

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In contrast, Com-

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aid known to modern

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origin of which had ob-

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Harris has been with ICL for

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credit cards. A user's view of

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## Multilateral thinkers

THOSE disposed to dismiss as a paper tiger the threat of the Japanese computer industry to the world hegemony of the US companies, particularly IBM, may be disposed to think again when they consider what is going on at Japan's leading mainframe manufacturer, Fujitsu.

According to the Japan Economic Journal, the Mecca for all budding Japanese systems engineer is Fujitsu's "Information Disposal System Laboratory" in Kamata, Tokyo. Although the title makes sound like a glorified municipal tip, the description of what goes on inside dispels any such misapprehensions.

"The atmosphere of this laboratory is completely different from that of any other ordinary office or manufacturing plant," writes the Journal.

"Men are almost perpetually

busy with their special rulers, formulating various programs by writing down cryptic circles, angles and lozenges. Then there are mountains of input cards. The workers' brains are thus worked to their very limit and their ways of thinking are never allowed to roam in single directions."

"The workers have to think not only vertically and horizontally, but also diagonally and even reversely. For such mental legerdemain, extremely tough nerves and devotion are mandatory."

One can well believe it. Our friendly neighbourhood IBMer is a pretty odd sort of chap, but he's not that odd. The question raised is whether IBM can compete in the long term with such single-minded devotion to duty. Today, motorcycles and family cars. Tomorrow, the world, Rex?

## Backgambling?

FOR the second time in four weeks, Adnan Jazrawi from Reading, chief programmer with ICL Dataskill, has won the monthly backgammon tournament organised by the Thames Valley Backgammon Club.

In the consolation event, a systems analyst with Marconi Space and Research Division, Michael Moore from Camberley was the winner over Sonja Ach, whose husband Jacques is also in the computer business.

In an interview after the competition, Moore was asked why so many computer people play backgammon, and he said that the game is

basically played by two types of people — gamblers and logical thinkers.

The secretary of the club, Tony Hood, who is not a computer person, wonders which of the two groups are predominant in the computer industry, and asks, "Are our computers designed and operated by gamblers who think logically, or by logical thinkers with a gambling instinct?"

Either way, Thames Valley Backgammon Club welcomes all players. Details of membership can be obtained from the secretary, Tony Hood, at 10 Monck Court, Southcote Road, Reading, Berks. Telephone Reading 583410.

## Ghost in the machine

AN interesting postscript to the recent Futureview interview with Arthur C. Clarke (November 10):

Webster: There's one area in computers that is growing quickly, and that is computer crime.

Clarke: Yes, it's a growth industry.

Webster: It has a whole terminology of its own:

## The sticking point...

THE news that the Tesco supermarket chain is to spend £8 million with IBM for this week's special computer offer, a 3031, a 3032, and other assorted commodities (CW, November 17) has prompted me into considering the obvious — whether Tesco will attempt to pay in unused Green Shield stamps.

If they do, just what can IBM expect to get through its corporate letter box? In

I took my 5 Mbyte Abacus in hand and set to work. The result is, to say the least, a large number.

IBM may just be on the receiving end of 18,181,181 Green Shield stamps. If Tesco are kind, and have long tongues, this could be reduced to 14 Megabooks. There is one problem: 3031s and 3032s aren't in my Green Shield catalogue.

If they do, just what can

IBM expect to get through its corporate letter box? In

IBM expect to get through its corporate letter box? In

## Pansophistry

PROOF that not all the visitors to Compac were data processing geniuses (genii?) was provided by some of the entries to a competition run at the show by software house, Pansophic. Visitors had to guess how many source statements there are

## IBM releases third Series 1 operating system

RELEASING its third Series 1 operating system in the US, IBM has given users a couple of surprises. The software has been released a month earlier than expected, due to early completion of testing, and it will control user programs in the maximum 128 Kbytes of memory.

The previous operating systems for the machine, CPS and RPS, only supported programs

in 64 Kbytes. The third product known as the event-driven executive, was expected to have the same limitation.

As the name implies, EDX is designed chiefly to handle programs dependent on external events, for example data acquisition and process control. In this role, the Series 1 seems likely to take over some of the applications previously managed by IBM's System 7. The

availability of such software also emphasises the distributed processing orientation of the Series 1.

The larger memory capacity

will, however, make the EDX system attractive to a wider range of users than the specialists, since large and more complex user programs and systems can now be accommodated.

EDX provides a multiprogramming and multitasking environment,

and includes support for dataset management, distributed processing, communication with a 370 host, generic entry, editing and interactive debugging, sensor handling, and graphics display. Terminals supported include 4979 VDU and any ASCII terminal connected through teletype adaptor.

EDX has not yet been announced in the UK.

## Gamma to expand in Europe and US



Dr George Coggan

### Gray quits presidency

REFLECTING the metamorphosis of Cray Research Inc from a development into a production and marketing company, founder and chief executive Seymour Cray has been appointed chairman. Cray hands over the post of president to John Rollwagen, previously vice-president for marketing and finance.

Rollwagen will be responsible for day-to-day operations and marketing, freeing Cray to concentrate on technical leadership for research and development.

The company builds large-scale vector processors designed for fast execution of complex scientific and technological tasks. They need to be fronted by a large general-purpose mainframe in most applications.

He told Computer Weekly:

"We are ten times the size of the average DEC systems house in the US and have been associated with DEC five times as long. In fact, we probably have the largest body of DEC software expertise outside DEC itself any-

AFTER several years of rapid expansion in the UK, the Digital Equipment specialist systems house, Gamma Associates, is aiming to expand overseas with joint ventures on the Continent and in the US.

Gamma's managing director, Dr George Coggan, is currently talking to US systems houses that might benefit from an association with Gamma.

He told Computer Weekly: "We are ten times the size of the average DEC systems house in the US and have been associated with DEC five times as long. In fact, we probably have the largest body of DEC software expertise outside DEC itself any-

where. In addition, few US organisations have our experience in running a PDP-II based sharing service."

Gamma is already closely involved with a US software house, AW Consultants, Philadelphia, in a joint enterprise called Gamma Telecomunications (CW, May 9). It sells systems that run AW's special multi-terminal network software to direct warehouses and retail outlets in the UK.

The Continental market is being looked at most closely. Gamma are Benelux and Scandinavia where the firm feels that the much lower cost of software development will enable it to supply about 70 per cent of the market charged by local suppliers.

Gamma Associates formed a company, GEC European Systems, specifically to set up joint ventures with firms on the Continent. Gamma Associates is aiming for over £2.5 million in turnover financial year.

COMPUTER WEEKLY in conjunction with the Data Processing Management Association is organising a workshop on December 1 aimed at improving the skills of DP management in communicating with end users.

The workshop will be given by Nigel Laurie, who has more than 10 years' experience in the communications and computer fields.

Numbers are limited to ensure that all delegates are able to participate fully in the day's work, but if there is sufficient demand, further workshops will be held.

In order to ensure that the workshop is tailored to DP management's needs, the DPMA is currently conducting a survey of its members on DP user communications. Survey forms can be obtained from the DPMA, 27a York Road, Maidenhead, Berkshire SL6 1SQ. Tel: 0028 20070.

If you would like to attend the workshop, please complete the coupon above.

### Polytechnic Systems

THE computer system installed at City of London Polytechnic, and referred to by Derek Esterson in his article on computers in schools (CW, November 17), is a Systech 5000 based on a Digital Equipment PDP-11.

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# MICHIE'S PRIVATEVIEW

Aha!—that flash of insight



IN the October issue of Scientific American Martin Gardner discusses the latest version of Robert Abbott's game of Eleusis. At the University of Colorado, Abbott, as a psychology student, became interested in the "aha" reaction—that flash of insight in which we grasp the underlying principle behind some messy-looking phenomenon.

In Eleusis the dealer has a secret rule in his head which governs what cards may and may not legally be laid face up in sequence.

The players take it in turns to add to the lengthening sequence in an attempt to work out by trial-and-error guesswork, i.e., by "inductive reasoning", what this secret rule is. Whenever they add cards which fail to fit, they collect penalties. Of the process of induction Gardner rightly remarks that it is "the process at the very heart of the scientific method."

Special interest should, therefore, attach to computer implementations of induction. Software systems are certainly needed to do more than donkey-work for the mathematician and scientist. Here, I note two recent laboratory advances in this area, one mathematical and the other in applied science.

The natural numbers, with the rules of arithmetic, constitute established territory for mathematical discovery, which in aggregate make up modern number theory. There are tantalising problems which can be very simply stated. Probably the most celebrated is Fermat's conjecture that expressions of the form  $x^n + y^n = z^n$  are not satisfiable for  $n$  greater than 2. Trial and error and inductive reasoning certainly play their part when mathematicians arrive at in-

teresting conjectures. Could a computer program, set loose in this problem space, wander around looking for good conjectures?

One reaction is "If all it is going to give us are things like Fermat's conjecture, then why bother?" After the spectacular application of prime factor theory to computer privacy, see D.W. Davies' articles (CW, June 15 and 22), I hope that computer people of all people will not sell number theory so short!

Doug Lenat, working on Stanford's Heuristic Programming Project, developed a program which wanders around guessing much the style alluded to above. Starting from basic essentials it rediscovered Euclid's "unique factorisation" theorem which states that a composite number can be factorised into primes in only one way.

This theorem is basic to the above mentioned encryption procedure.

Lenat's program, which has the curious name AM, first had to discover the concept of a prime number, and before that the concept of a number. It started life with a collection of concepts no richer than those of a child of four—objects like sets, lists, bags (sets allowing replication of elements) and truth-values; relations like membership and equality; composition and intersection.

It would be a mistake to shrug off this experimental program on the grounds that it has not yet discovered anything which mathematicians did not already know about. One of its discoveries, "maximally divisible numbers," was at first believed by Lenat to be new, and by a number of mathematicians whom he showed it. Later it

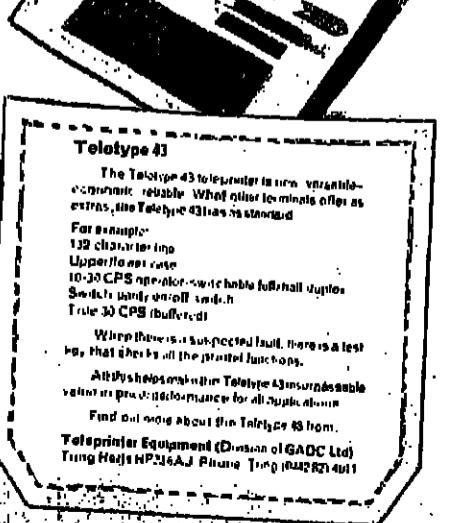
was fully acceptance.

The planned next step is to equip Extension Offices with terminals online to the new rule-based system, so that staff can get the farmers quicker, and it seems more accurate, answers.

Computing systems have heretofore been used only for deductive-type operations. But new additions to the information engineer's tool-chest may be on the way.

*Donald Michie*

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## Puzzler

A SQUARE-BASED pyramid has eight edges and five vertices. This week's puzzle is to give each edge a different number, from 1 to 10, in such a way that "the sum of the edges meeting at each vertex" is 16 in all cases.

The big problem is to decide which eight of the available ten numbers must be used. See page 47 for the solution, which is unique apart from rotations and reflections.

## SOFTWARE FILE

# Business Basic 'first' on micro

THE range of applications software produced by consultancy KPG on its Solitaire system (CW, August 4) conceals an interesting systems software product—what is claimed to be the first business-oriented Basic on a microprocessor.

In the debate between compiler and interpreter philosophy for micros, KPG has come out wholeheartedly in favour of interpreters, largely because they allow immediate testing of code during program development. Some companies, favouring faster run-time, have plumped for a compiler approach.

KPG's current applications software for the Solitaire includes word processing, sales, purchase and nominal ledger, time analysis accounting systems for

convertible to other makes of micro, said KPG.

Many of these packages were implemented initially on its Basic Four minicomputer, a Business Basic for specific clients, Development of its Solitaire interpreter allows simple conversion.

Besides satisfying the requirements of purely commercial installations, availability of word processing and commercial software could encourage users to put both types of applications on the same machine, rather than implementing a delicate word processing system.

## £17,500 Mascot deal

AIMING to ease use of the Mascot software development technique with Coral 66, the Ministry of Defence has awarded a £17,500 contract to Systems Designers Ltd, to study formal definition of the Mascot methodology and implementation of the support software, in a way more amenable to Coral programming than to the present Algol 68 environment.

Some Coral implementations of the software have already been made, but it is SDL's eventual aim to make the software portable, to dovetail with its portable Coral compiler. Extensions will also be made to Coral language to ease programming under Mascot.

Mascot was originally developed by the Royal Signals and Radar Establishment, SDI. Initial Coral versions of the port software for the Textron instruments 980/9800 series, the Prime 300, will appear next year. An initial version of the methodology document is already circulating.

## Disc space manager from Macro 4

YET another product has been added to the growing range of IBM-oriented disc-space management aids on the market. The latest product, Spaceman, has been released by Macro 4, of Wallington, Surrey.

Having defined the initial extent of the required disc space and a few other controls, Spaceman requires no more JCL cards relating to placing of disc files, says Macro 4.

At the same time, Macro 4 announced further enhancements for Logout, the package which prints relevant parts of System Ten configurations by addition of small modules.

Solar has the dual aims of speed of response and ease of use, says Safe. The user interface is interactive, prompting for required information. Such prompts are particularly useful for novice users, and can be avoided when a user becomes experienced.

The Solar package can reflect the manual procedures and interface with them during a gradual cut-over process. It can also be tailored to individual System Ten configurations by addition of small modules.

Solar can be fully interfaced to Safe's production control software, SafeS, also implemented on the System Ten.

Seven partitions are sup-

ported, and JCL is partly dependent. Thus a given job can be executed in any partitioning scheme.

Spaceman was originally developed by Cordiale, Macro 4's Dutch Associate company and already has three users in Holland. There are, as yet, no UK users of the package.

Oriented to IBM 370 DOS/VSE environments, it is claimed to avoid several points of incompatibility with standard IBM software.

The user can however, control the order in which the discs on line are examined to decide the placing of the files.

The product can now bypass console messages requiring reply, so that the user can accept the replies in any order without holding up work.

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EDITED BY STEPHEN BROWN

## Parameter driven pensions scheme

ANOTHER package has been released to aid company administrators to cope with increasing government legislation, this time in the pensions area. The Passman software, from financial software consultants Heywood and Partners of Liverpool, is particularly concerned to handle the requirements of the 1975 Act of Parliament on this subject.

Passman is a parameter driven sys-

tem which maintains files of all a company's pensionable employees, and periodic updating of records with all entered pension transactions.

Required government forms are generated as well as user-defined in-

ternal reports, auditors' information and periodic—usually annual—pension statements.

The package is written in Cobol and avoids machine-specific subroutines as much as possible, said a spokesman.

Hence it should be easily portable. At present, versions exist for IBM 360/370 and ICL 1800 and 2803/4 machines, but one of the first prospective users requires a conversion to Univac equipment.

Non-standard modules can be added to the Passman system to manage accounting of pensions contributions and payroll for employees and dependants entitled to a pension.

There are already about 10 "highly probable" prospective users of the package, said Heywood. Passman can be used on an in-house machine, or Heywood's ICL 2804 bureau.

## 'Switch to rival' threat for VSPC

RENEWED criticism of IBM's Virtual Storage Personal Computer time sharing software is emerging, particularly in the US, almost two years after the product's release.

As the same time, M Dreyfus confirmed that between 10 and 15 per cent of the group's shares have come onto the market. These shares belonged to two former directors who left the group two years ago. Contrary to US reports, the group is not looking for a US company to acquire the shares. "They may be taken by any company, US, European or British," said Dreyfus.

Vsam and Vsm interface problems seem to apply equally to both countries.

Assessment of IBM's support efficiency varied. One user said that the company had been "very good" at responding to problems, but another thought that the IBM in the UK was comparatively short on VSPC expertise, due to the smaller user community.

## PL/I versus Algol 68 debate

FEW software topics arouse more energetic dispute than the advocacy of one programming language over another. The audience at a debate sponsored by the BCS PL/I specialist group, on December 1, is thus assured of an interesting evening.

The position had improved, but nine days was still the record time between failures. Efforts to improve it led to operating system enhancement failing badly.

The Centre for Disease Control reported that VSPC was tying up machine resources to the detriment of other users. The only way to remedy this was to cancel VSPC. This resulted in the loss of related data, such as APL workspaces, although this was not supposed to happen.

One UK user supported this criticism. The installation said a spokesman, could live with the increased resource consumption of VSPC if it could control the priority of the system at times when non-VSPC work was more important.

Generally, however, UK users' troubles have not been so severe as those in the US, though the

## CGS plans move into US market

A MOVE into the US market is likely for the European CAP Gemini-Sogefi consultancy group next year. No firm arrangements have been concluded yet, chairman Philippe Dreyfus told Computer Weekly.

But CGS is definitely investigating the possibility of founding a US office.

At the same time, M Dreyfus confirmed that between 10 and 15 per cent of the group's shares have come onto the market. These shares belonged to two former directors who left the group two years ago. Contrary to US reports, the group is not looking for a US company to acquire the shares. "They may be taken by any company, US, European or British," said Dreyfus.

## Dynamic OS

THE latest operating system for Interdata, Dynamic OS/32 MT, and its associated Multi-Terminal Monitor (CW, October 27) have, as expected, been officially released in the UK. The operating system is priced at £3,350 and MTM at £1,080.

## PROGRAMMER NOTES

### Ode to the joys of freelancing

MANY of our past discussions on the programmer's life have made the tacit assumption that most of our readers are permanently attached to one particular company.

On the other hand, the employer is more willing to train an inexpert permanent employee than an inexpert free-

lance. Freelances have had experience of permanent programming posts. Do you find employers more assiduous in assessing your expertise when being interviewed for a permanent position or for a freelance position?

The increasing proportion of freelances and prospective freelances was graphically illustrated last week at a meeting of the Association of Independent Computer Specialists. More than 120 people turned up to hear about the advantages and disadvantages of freelancing.

Perhaps it is time we gave the freelance programmers a platform to discuss their view of the joys and problems of programming.

To consider the above question first: most installations nowadays have, for good or ill, their own program development techniques and standards, ranging from comprehensive strategies like the Jackson technique to simple data naming conventions.

It would be interesting to see whether freelance programmers fit in easily with these established environments, or whether it is a source of conflict.

Does the installation try to impose its standards on you, and, do you, in consequence, have to be flexible? Or do most installations allow a freelance to program in his or her own style, risking possible conflict with the permanent programmers?

There must be a number of interesting technical and personal consequences of transitioning from a regular to a freelance life. Programmer notes stress that the freelances among our readers will come forward with some happy and/or harrowing experiences.

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# PEOPLE

## Telephones for deaf from computer centre

CHILDREN at the Royal School for the Deaf in Derby can now use the public telephone system, thanks to the staff of the Derby Post Office Computer Centre.

The Centre's Benevolent Society has donated to the school two phonetypewriter, which convert into a typed message at the receiving end.

The phonetypewriter is a reconditioned and adapted Post Office telex machine, for which the official UK supplier is the Breakthrough Trust at Wellingborough.

The phonetypewriter can also be used as an internal link between the school buildings, and will help any children to increase their language ability, said the principal.

Peter Thomas, former senior sales consultant with ICL, has joined the commercial systems division of Computer Automation as Southern region sales manager.

Other newcomers to the division are Ivan Teiger, previously high-volume product support manager with ICL, who joins as customer support manager; David Mundy, formerly a systems analyst, who becomes systems engineer; and Cheryl Lewis, who was a project administrator with ICL, and who will run the new planning and admin department.

Deaf people can make calls to ordinary telephones through one of the five or six link-up centres throughout the country, and this is particularly important to the children at the Royal School, who come from all over the UK and who can now telephone their parents when they are at school.

The machines can also be used as an internal link between the school buildings, and will help any children to increase their language ability, said the principal.

Bill Butt, who until recently was commercial and OEM systems manager with Varian, has moved to Wang as computer products manager in the technical and commercial sales division.

Richard Forsyth, lately academic programmer at the City of London Polytechnic, has moved to Rail Timssharing as software manager. Tony Green has joined Rail Terminals as senior sales engineer for the UK and Europe. Jim Horstley joins Datasolve as publications executive. He was formerly a journalist with Southern Newspapers.

Arvinder Bawa has been appointed support engineer with Atkins, and joins the company as leader of the Civil engineering team. He was formerly with consulting engineers Binnie and Partners. David Hinsey also joins Atkins as a support engineer, and will be concerned with the support of ASAS. He was formerly with Hunting Engineering.

Kenneth Walker becomes financial director of Kode. He was previously with Mono Container as financial director.

Neilson Kite, previously publicity manager for ICL Dataskill, becomes PR manager at BOC Datasolve. Jim Horstley joins Datasolve as publications executive. He was formerly a journalist with Southern Newspapers.

Stephen Bishop, consultant with CMG, has been appointed an associate director of CMG West End.

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# LETTERS

## Power at Datafair

I SHOULD be grateful if you would correct an error of fact in the final paragraph of Focus (CW, October 20).

There were no power problems at Datafair. So smoothly did it all go that one of the IBM executives remarked to me nostalgically "It's not fair - why aren't we having any dramatic power cuts?". Shades, I understand, of 1975. But that was two years ago - perhaps your correspondent never recovered from the trauma!

## Demonstration

IN the report on the exhibits at Datafair (CW, October 20), the demonstration of bubble memory by Plessey Memories was mentioned and it was said that the demonstration was not operating.

We would like to stress that although a short mains power failure in the hotel caused a temporary stoppage of output VDU, in fact, the non-volatility

P.S. Just remembered! A fuse went on the third floor due to an overload in one of the technology corridor rooms. This was attended to in the record time of four minutes flat. I know, I was there all the time, and it only affected the five rooms involved.

RUTH REES  
Conference Organiser  
Datafair

Comment from Focus: "I was there during the four minutes blackout. Perhaps I'm getting too shocked!"

inherent in the bubble memory system ensured that none of the stored information was lost, so that the demonstration was able to continue immediately mains power for the VDU was restored.

P. C. NEWMAN  
Product Manager,  
Magnetic Bubble Memories  
Plessey Memories,  
Towcester.

## Interrupt misses punchline

YOUR "interrupt" contributor seems to have missed the punchline.

The point about the Titan simulator, if I remember it correctly, was that it always said "system full" after you typed in your password; thus you would never know that you had given your password to the simulator (which could be left running at an unattended terminal) rather than to Titan itself.

This simulator would write the user identifier and password to its own file-store and the victim would never be any the wiser.

MICHAEL KAY  
Crowthorne,  
Berkshire.

## No guarantees in this unpredictable world.....

IN his letter Peter Haine appears to present a very short-sighted view of the efficacy of professional standards in preventing disasters (CW, October 27). He lists several computer applications which have in common the factor that human life or something else of vital importance can depend on the satisfactory performance of a computer system, and he goes on to suggest that such standards provide a guarantee of this performance and a means of redress should it be lacking.

Surely he cannot be unaware that in this unpredictable world in which we live no guarantee of any such thing is possible, and that nothing can provide real redress for loss of life, or indeed for many other great catastrophes.

Mistakes occur in all fields

regardless of whether there is a code of professional conduct governing those responsible; planes crash, bridges fall, patients suffer needlessly, millions of pounds get embezzled, and we must live with the fact that the frequency of such happenings can sometimes be reduced, but that they can never be eliminated altogether.

The lack of success which advocates have had in convincing anyone but themselves of anything more than these standards is involved may perhaps be taken as an indication that it will not so become in foreseeable future.

Integrity and skill are excellent things at which to aim, but they are just as excellent for those who work in areas where they cannot aspire to professional status as for those who do. If computing is to become an

K. A. JOHNS  
Welsh National  
School of Medicine,  
Cardiff.

Cash dispenser net

IN your report on the installation of cash dispensers in the Trustee Savings Bank (CW, November 3) it is claimed that this is the only cash dispenser network in England debiting accounts in real time.

The Cashpoint system of

Lloyds Bank was introduced in December, 1972, and has always been based on an online real

time operation. We find it sur-

prising that you should report an event as a breakthrough some five years after our intro-

duction of Cashpoint.

G. B. HAGUE  
General Manager  
Lloyds Bank, London.

OP SPOT By Bernard Allen

## Role of the job control section

THE job control section has a vital part to play in the day-to-day running of an installation. Its role is fundamentally that of co-ordinator between the user and the computer room, and in doing this it should provide the user with a service and the operators with any information they need to carry out their function.

Any jobs submitted through the job control section should be accompanied by an adequate level of documentation informing the operators of the requirements of the job. The facts related should include disc usage, tape requirements, priority and any special requirements and deadlines to be met - anything, indeed, which will save the operator time.

The service the section provides for the user should be of a particularly high standard. He should be able to find out the status of his job, the state of the system or the likelihood of obtaining machine time at short notice, and should his job be returned incomplete, the section should endeavour to find the cause.

The job control section should be constantly aware of what is happening in the computer room and provide an efficient method of controlling the flow of work within the installation.

In some installations operators are given the chance to spend time in the job control section, and this provides them with a better overall view of the manner in which the installation is organised and run. It also enables them to consider the problems faced by the job control section because the relationship between the operator and the section is often strained. And the reason for this is a lack of awareness of each other's problems.

To keep in touch with events

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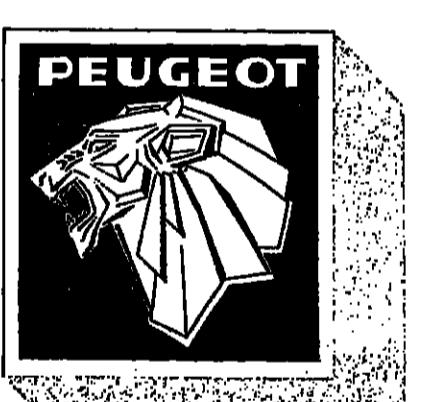
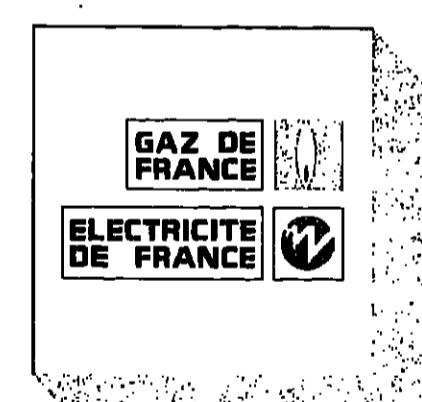
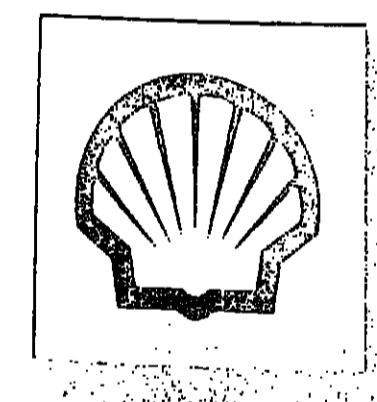
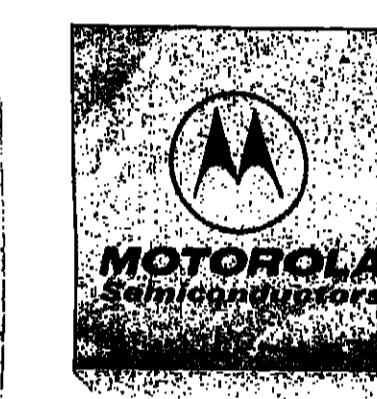
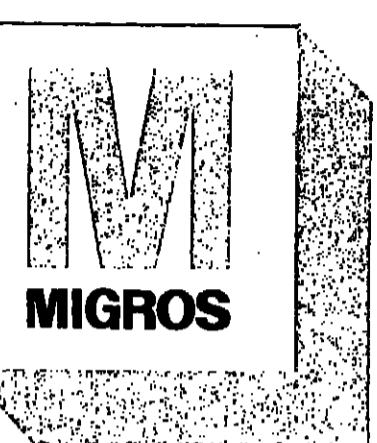
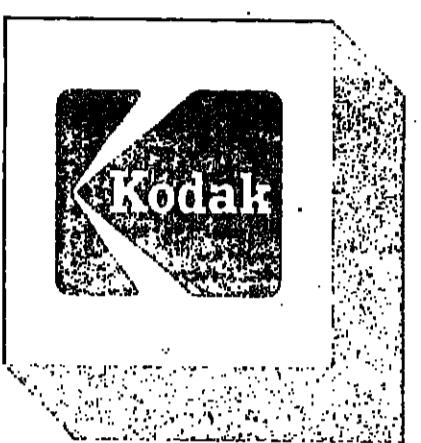
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Informatics

## Siemens in joint venture with AMD

THE joint venture company formed recently by Siemens and Advanced Micro Devices (CW October 13) may still lack a name to operate under, but is not without plans.

Two facilities are to be established, one in Sunnyvale, California, and the other in Munich, West Germany. Each will be located close to its respective parent company to draw on its expertise when necessary, and their first task will be in development work for the microcomputer systems, systems components and software products it plans to introduce. Although there will be considerable collaboration between the two facilities, each will undertake development work that is geared to its own marketplace.

Designated MPM-202, the manual reviews the architecture, organisation, and operation of the processor and describes the two levels of assembly language. It also provides detailed coverage of the CSDP constituents.

## Instruction manual

THE fifth in a series of instruction manuals on the RCA CDP 1802 microprocessor which covers the use of the Cosmac Software Development Package has been published.

The package is an interactive aid for developing and checking programs for the microprocessor, with facilities that include a cross-assembler, an error checking simulator and a range of debugging tools.

Designated MPM-202, the manual reviews the architecture, organisation, and operation of the processor and describes the two levels of assembly language. It also provides detailed coverage of the CSDP constituents.

The 88-page manual is available from RCA's sales office in Sunbury-on-Thames.

The joint venture follows Sie-

### Portable machine

A PORTABLE 16-bit microcomputer, configured around the new half-card Digital Equipment LSI-11/2 should be available early next year from Gamma Telecommunications of Wokingham, which represents the US firm, General Robotics of Hartford, Wisconsin.

The portable machine will be able to run DEC PDP-11 systems software. A range of microcomputers based on the LSI-11 will be introduced early next year by Heathkit of Gloucester (CW, July 21).

# First edition

Something unforgettable has happened to DEC's LSI-11 and PDP 11/03 computers.

It's the new Intel In-1611 Add In Memory system. Featuring a standard 2 wide printed circuit card up to eight times more dense than DEC's own memory system, the In-1611 represents a real advance in design and economy.

Available ex-stock from Rapid Recall, the In-1611 is available in 8, 16, 24 and 32K models - all with access times of less than 450 nanoseconds. And all units are directly compatible with the DEC systems.

### pocket sized

For immediate off the shelf delivery of any In-1611 unit - or for more information get in touch with Rapid Recall (tel: 01 379 6741).

Also available - In-4711 series.

This plug-in memory module provides 16K words plus parity on a single card and occupies only a single PDP-11 card slot. The In-4711 can be used with the PDP-11/04, 11/05, 11/10, 11/34, 11/35, 11/40, 11/45 and 11/50.

The new Intel In-1611 Add In Memory, intel



## Intel to cut prices with new devices

men taking a 17 per cent share in AMD for \$22.5 million. The share price, \$45 each, was established by monitoring the market price for AMD over a period of 5 days before closing the deal. This left Siemens paying an actual 85 per cent premium for the shares, as they fell after the deal was closed.

To be headed by AMD president, Gerry Sanders, the joint company has an equity of \$5 million, and is 60 per cent owned by Siemens. In addition, the Germans have put in a further capital of \$5 million.

INTEL is launching a dual attack on the microcomputer market, with the announcement that the 8086, 16-bit device will commence customer sampling during the first quarter of next year, and the news that savage price cuts, coupled with new introductions, are being made in the single chip, 8-bit market.

The 8086 is software and peripheral compatible with both the 8080 and 8085, 8-bit processor families, although to obtain the best results from the part, code translation will be required. This will give a throughput increase of between 10 and 15 times the 8080, which the company claims will give it a similar processing capability to the PDP-11/45. Without code translation, throughput will be increased only around 5 times.

The part will also have an increased, but unspecified, instruction set, which will include some compiler statements to which the CPU will respond directly. To accommodate these, a new version of Intel's PL/M

high level language is being prepared, to be known as PL/M 86. It will not employ memory or memory architecture, using registers instead.

-Peripheral compatibility is attained by designing the part around the 8085 I/O bus, though the key to this may well be the use of the new 8089 I/O processor device, which is not scheduled to appear until the third quarter of 1978. This will link 8080 peripherals and the MCS-88, the microcomputer system to be based on the 8086 processor. The address capability will be a maximum of 1 Mbyte, and 50 nanosecond memory devices can be worked directly.

The pricing on Intel EPROMS has also been chopped, with the 2716, 2K by 8 bit now down to £27.40, the 2708, 1K by 8 bit to £12.90 and the 2708, 1K by 8 bit to £13.70 - all in quantities of 1000.

The new introductions are aimed at taking the company a step nearer its goal of achieving a single chip "system" rather than single chip computer for control applications. The first is the 8021 processor, for which sampling has just started. This basically a stripped down 8085 device housed in a 28-pin, rather than a 40-pin, package.

The main difference is that the 8048's capability for expansion to off-chip data memory has been removed, leaving it with the on-board 1K byte ROM and 64 byte RAM only. Input/output lines have also been trimmed down to 21 lines. Intended specifically for consumer control applications, it features on-pin as a zero crossing detector, together with two high voltage drivers. In quantities of 1000, the device will be priced at £1.

Spreading in the other direction from the 8021, the second introduction is an upgrade of the 8048 device. Known as the 8049, this features 2K bytes of ROM, 128 bytes of RAM, and has a 10MHz clock frequency. This gives the device an instruction cycle time of around 1.5 microseconds, and a two-line speed improvement is planned.

From the small to medium scale user, categorised as an annual consumption of up to 10,000

units, there is a growing trend to use the 8748, EPROM version of the 8048 microcomputer in a production role. Designed as a development tool using EPROM memory rather than masked ROM, the device has found increased use with companies having several small volume applications for the one device, where its increased cost can be traded off against mask generation costs for the ROM on an 8048. In consequence, Intel has cut the 100 up quantity price from £200 down to between £27 and £33, depending on variant.

The part will be possible on the existing MDS-800 development system, and a range of SBC-88 single board computer assemblies will be available. These are virtually the same as the SBC-80 boards, and are basically just awaiting the arrival of the processor.

In common with the 8080 and 8085 processors, the 8086 will be able to use Intel's Multibus bus structure which, with 5MHz operation, will allow the construction of a multiprocessing system incorporating up to 16 master processor boards, in any combination of the 8080, 8085 and 8086.

As a derivation of the 8086, Intel will also be introducing the 8088 part during the third quarter, which will have a similar 16-bit internal configuration to the 8086, while having an 8-bit external data bus.

In the single chip microcomputer market, where the majority of use is found in high volume industrial and consumer control applications, the company is launching a two-fold attack, combining savage price cuts on some products with the introduction of new devices.

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As a derivation of the 808

# More users turn to online working

THE punched card is dead — long live the online terminal! It isn't quite as dramatic as that, but visitors to this year's Compex, for example, were left in no doubt that the terminal is by far the most important peripheral product, and that more and more users are turning to online working for data entry, program development and transaction processing.

For the DP manager with strong enough nerves to handle the development of online, mini-handling software, the benefits are many. Program statements can be entered more quickly through a screen, and verification is practically automatic. Many users find that programs input in this way, for example, are 100% accurate — a level of accuracy rarely

**RICHARD MILTON** says that this month's Compex left visitors to Wembley in no doubt that the terminal is by far the most important peripheral product, and that more and more users are turning to online working for data entry, program develop-

ment and transaction processing. Here he describes some of the benefits which await the DP manager with strong enough nerves to handle the development of online, terminal-handling software and outlines recent hardware innovations.

achieved with either card or magnetic tape input.

Programs can also be altered much more easily on a screen, and this is a facility which is particularly useful where a number of similar programs have to be produced, varying in some details. It is even possible to write small programs while sitting at the screen.

The reference to the demise of the punched card is, of course, premature to say the least. And if anything, the online terminal

has given this method of data entry a new lease of life as far as jobs like file creation are concerned.

Just what kind of terminal the user will go for depends, of course, on the speed and throughput of his application and on how time critical it is. In the past, remote job entry was a popular way of getting "miles" out of an existing mainframe. But the increased price-performance of minis have made them the first choice of

many users for dedicated applications and the RJE terminal is losing favour in some quarters. Remote job entry tends now to be offered as merely one of the facilities in the new breed of intelligent terminal.

The microprocessor has meant that greater intelligence in new terminal products is almost de rigueur and the current generation of products pack the power of a respectable mini. Aside from purely technical developments, though, there are

a number of market forces

pushing display terminals into

prominence.

The

minicomputer manufacturers have identified the VDU as their biggest selling asset. Ease of program development and data entry, and the immediate impact on the prospective customer of transactions conducted on the screen have contributed, in no small measure, to the mini's appeal and the success of intelligent terminals. This has resulted in the mainframe makers themselves (notably IBM, ICL, Univac and NCR) pushing the benefits of online terminal-oriented systems.

Not only the mainframe manufacturers have responded to the challenge of the mini firms. Baric, for instance, recently introduced its DataCare service, in which the user buys an ICL 1500 online terminal as part of a package of bureau services.

Many new ranges of terminals have appeared in recent weeks. ITT business systems, which has been active in the market for some time with an IBM-compatible system, the 3280, has now launched a new video terminal, the 3230, and an intelligent terminal system, the 3630. Hazelton, following a general trend to cheaper terminals, has launched its H 1500 low price family of VDUs with a one-of price of £200.

Colour has yet to catch on in a big way as far as the professional user market is concerned, but Reading-based Crows has launched several models capable of displaying in high resolution and full colour. The company also produces screens with built-in teletext facilities to receive Cetex and Oracle.

Also active in the colour field

is a newly formed division of Gresham Lion which has produced two colour information display systems aimed at applications such as satellite, radar and X-ray scanner pictures.

Also at the low-cost end of the range is the 1200 VDU page printer introduced by Perkin Elmer. Aimed at transaction processing applications, the 1200 includes editing facilities and simplified host computer programming and sells in quantity for £1,100.

Graphics remain a minority

interest, but the market is at

least active enough for one of

the major manufacturers in this field — Tektronix — to have launched two new graphics displays. The GMA 101A and 102A are designed to allow users to do some tailoring to their own needs, but are aimed basically at applications like printed circuit layout, document preparation using different fonts, and high resolution scientific work.

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Another driving force is the

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## ONLINE SYSTEMS

# The solution to an advertising problem

By Laura Tatham

ALMOST all the activities of an advertising agency that are not directly creative generate a mass of paperwork that is complex, volatile and highly time-dependent. It therefore seems strange that although many agencies use batch computing, only a handful have yet exploited the possibility of online computing.

Occasionally this omission may be due to ignorance. More often it is the inability to afford an in-house system of any kind. Fewer agencies still could find the resources to develop, operate and maintain an online system which, to be fully cost-effective, would probably be too elaborate for a minicomputer to handle.

Several agencies in London, however, have found that a comprehensive online service known as Medline provided by

Donovan Data Systems provides a highly satisfactory solution to this problem.

Donovan is an independent bureau company with clients in North and South America, two European countries and the UK. The bureau service is unique in its kind in the UK, and is dedicated to the work of advertising agencies and, to a lesser degree, market research agencies.

Situated in Mayfair, London, Donovan's computer centre is equipped with an IBM 370/135 with 500K bytes of main store and front-ended by an IBM 3704.

At present a total of 22 video terminals, split roughly equally between IBM 3270s and ITT 3280s, are linked to the system, all but two being in users' offices.

This total will reach 30 by the end of December, and by April

1978 it will be 42, says Roy Tinker, vice president and UK general manager, who is also planning to upgrade the mainframe to a 370/138 by the end of next year.

In casting in their lot with Donovan, London advertising agencies, such as J. Walter Thompson, French Gold Abbott Kenyon & Eckhardt, and BBDO, etc, are following the American example, where more and more agencies are closing down their in-house installations. Some 30 of them, including 15 of the top 20, are Donovan clients using nearly 300 video terminals and a nationwide data communications network.

The non-creative activities of advertising agencies can be

summarised under three broad headings. First is campaign planning. This involves selecting the media which, in the agency's judgment, will give the client's message the most effective impact, subject to budgetary limits and other constraints such as the need to co-ordinate with a new product launch.

How many media are relevant obviously depends to some extent on the nature of the product or service. Nevertheless, the list of possibilities may run into hundreds and the total available into thousands. The structure of charges for advertising is also far more complex than a layman might suppose.

Rates will differ, for instance, according to position in a

publication or time-slot on the air, the size of space or amount of time required and whether a single ad or a series is booked.

Though final decisions must, of course, depend upon skill and judgment and cost alternative schedules are obviously of considerable value.

Secondly, there is the recording of the selected bookings which is also the basis for client and other accounting. In the advertising business, cancellations and changes are frequent due to factors varying from second (or third or fourth) thoughts on clients' part to feedback after a campaign has begun. The problem is therefore similar in the nature to that faced in airline seat reservation.

Thirdly, because advertising is fiercely competitive, and clients expect it, the agency must be in a position to quantify the effectiveness of its work. For its own good health, it must also be able to assess the profitability of its clients.

It is easy for the computer-minded to see, — though it is only recently becoming apparent to British advertising agencies — that online operation is the perfect answer in this environment. It is equally clear after talking to Tinker why it is economically impossible for most agencies, if only on the grounds of cost, to build and operate their own systems.

Integration of the records used by the various departments of the agency is necessary, not only in the interests of accuracy and consistency, but to obviate repeated data entry. A large database must be designed, maintained and constantly updated. The program for media scheduling is large and sophisticated and the transaction processing software complex. Donovan's US parent, which initially develops software (though modifications are made locally to suit varying national practices and there is a two-way exchange of ideas) allocated some \$600,000 in 1977 alone for program development and maintenance.

As befits the servant of a service industry, Donovan maintains close and constant liaison with its customers, in order to ensure they get best possible value from the system and to help solve any problems they encounter.

A useful device in this connection is the ability to call on to a computer centre video terminal (which is constantly attended) an identical display to that currently shown on a user's screen. This facility, in conjunction with a telephone conversion, helps users sort out problems that arise.

Another factor that militates against the individual user is the need for constant system availability. Over 25% of Donovan's software is oriented towards recovery. As a result, the worst that can possibly happen to a client is to lose a few hours' input. A further safeguard is a standby arrangement with a user of a similar configuration.

Working through CICS, PANVALET/ON-LINE provides new tools that streamline the editing, display and processing of programs, while the program library is protected at all times. A complete hard copy audit trail of library change activity is produced automatically. And PANVALET security, control, compression, management reporting, level numbers and backup are all capabilities of PANVALET/ON-LINE.

Across all industries, people in the IBM 360/370 environment USE PANOPHIC products... because they work and because they offer practical solutions to real problems. Call or write today for further information on our complete line of proven software products.

## ARE YOUR PROGRAMMERS ON-LINE OR IN LINE?

If you have already made the move to do on-line program development and maintenance, you know about the wasted time and clerical functions you have eliminated by being able to test, debug and text edit programs via the terminal. Because PANOPHIC is a company dedicated to programmer efficiency, we have developed PANVALET/ON-LINE to optimize your online programming efforts.

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**At the push of a button...**

From page 17  
upper limit in mind while designing the system and subsequently programming it and to ensure during acceptance testing that it has not been exceeded. If performance is not satisfactory, various tools are available for measuring the internal performance of some, if not all, of the TP monitors. Their use will enable you to find out "where all the time goes"; and then hopefully tune your system in order to make it perform better. Depending on the amount of work involved, such an exercise can further delay implementation, and it is surely better to get the system design right in the first place.

And when that happens, it's up to us with the feasibility study manual again, back to the drawing board. Now, where can we find somebody who knows something about warp-resistant memory?

At last, the great day comes! The equipment is installed; the last minute bugs have been ironed out. Those embarrassing

demonstrations when everything goes wrong have been successfully explained away and Gladys in stock control can start hammering away at the keyboard.

And, what do you discover? Almost inevitably the system will not be used the way you envisaged. Nevertheless, online systems are generally popular with non-DP people, perhaps simply because they can tailor them to their own requirements.

Maybe you can judge just how popular yours is by the time it takes before someone comments casually, "wouldn't it be handy if we could change that amount right at the terminal?"

And when that happens, it's up to us with the feasibility study manual again, back to the drawing board. Now, where can we find somebody who knows something about warp-resistant memory?

Laura Tatham takes a look at a bureau service that is claimed to be unique of its kind in the UK — dedicated to the work of advertising and market research agencies. She says that while it is easy for the computer-minded to see, it is only now becoming apparent to UK advertising agencies that online operation is the perfect answer in this environment.

## NEWS IN BRIEF

### Quiet power for 3032

ONE of the problems facing IBM users planning a switch to the new 3032 mainframe is the need to provide a power house outside the computer room for the motor-generator power supply. MPL of Hayes is offering an easy way out of the problem with its ML 5471 TQI frequency converter, which has been designed to be compact and quiet enough for installation within the computer room itself.

The unit provides output of 75kVA at 441 Hz and 208 volts, and is suitable for both the 3032 and 3033.

### Chinese order

THE Peoples Republic of China is to spend \$4.1 million with Electronic Associates of New Jersey, for a hybrid computer system to be used in a simulation/research laboratory. The order, which still awaits US Commerce Department approval, is for a Hyshare 700 system incorporating three Model 781 analogue consoles, a Systems Engineering Laboratories 32/55 computer, Hyshare software and related interfaces. An export licence is being applied for.

The product, developed by the Post Office, but engineered for production, manufacture, and marketed worldwide by STC, is OPAS, Operator Position Assistance System.

OPAS is designed to cut out much of the tedious work the telephone operator at present has to do in connection with assisted calls such as credit card, long-distance coin-box, some overseas, and reverse charge calls.

As play in the system and integrated circuits for control of other functions associated with the main keyboard.

much a call has cost. Its modular design allows a wide variety of other features to be added to meet particular customer requirements.

The compact solid state display on the system is also a British development. It comes from Phosphor Products of Poole, Dorset (CW, October 7, 1976), and uses DC electroluminescence of zinc sulphide particles. The result is a yellow-on-brown display, a combination which was chosen by Datasaab for its Dju 30 VDU following a major investment to establish the most comfortable colour combination for long periods of viewing.

Conceived from the start as an exportable product and designed to be built into existing operator consoles, OPAS has won its first export order, worth £400,000, in Sweden. The telephone exchange at Örebro, serving most of southern Sweden, is to be fitted with a 30-position OPAS system which will facilitate the work of the operators who have to handle Southern Sweden's large population of radio telephone users.

The OPAS system automates the call set-up procedure once the operator has recorded the calling and called numbers; it records all the information needed for billing, a task at present done manually on cards: it automatically checks that the correct money has been deposited in coin-boxes; and it times calls for billing purposes, for instance when the calling party asks how

Europe," Dr Peter Troughton told Computer Weekly.

Dr Troughton is responsible for technical development of the equipment associated with operator services, and conceived OPAS, which within the Post Office is called ACRE, Automatic Call Recording Equipment.

"Our next step will be to add a bubble memory backing store to the system for storing local telephone numbers. We are very pleased that a system developed from the outset with the world market in view should have resulted in such a promising product."

STC will be building the system to be installed by the Post Office, and the first will go in next year.

STC had to make several adaptations to meet the specific requirements of the Swedish PTT, and looks for business totalling £1.5 million from Sweden.

"We started programming in a macro language, but switched to PL/M when it became available, partly because we had an eye on the export market and partly because PL/M is widely used in

— Tim Palmer

## Water billing project ends

### PARLIAMENTARY REPORT

Noise Abatement United Kingdom November, 1977

Dear DP MANAGERS & FELLOW SUFFERERS

### With Reference to NOISE

Are your data input and output devices noisy? Then Consult: NIGEL MOSS (our principal researcher) on 01-205 0033, Ext. 23.

He has some positive suggestions!

The Power Equipment Company, Kingsbury Works, Kingsbury Road, Kingsbury, London, NW9 8UU

Or if you would like literature send the coupon below to Nigel Moss at PEC.

Company: \_\_\_\_\_  
Address: \_\_\_\_\_  
Your name: \_\_\_\_\_  
Position: \_\_\_\_\_

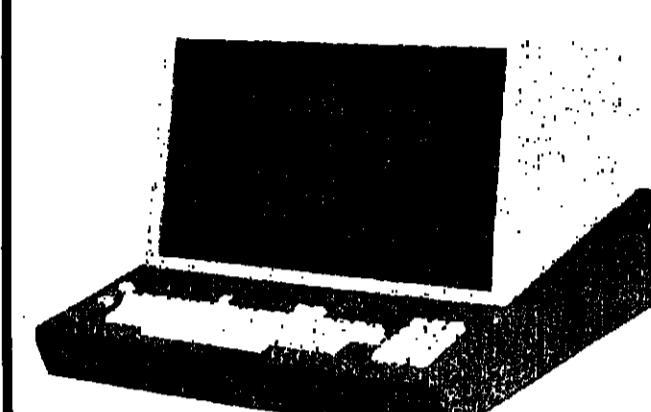
### Fairchild F464 memory

FAIRCHILD F464 dynamic serial memory, thought to be the first 64K bit charge-coupled device to come into the market, is constructed as sixteen, 4K "serial parallel serial" blocks, in which one bit from any one of the blocks can be addressed.

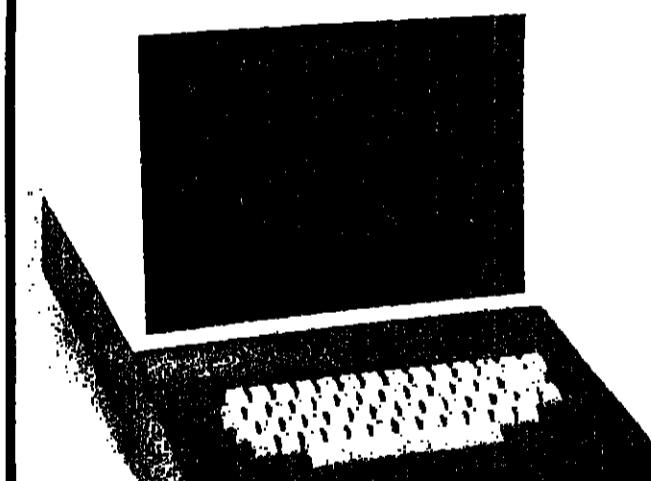
The device operates from 1MHz to 4MHz, over a temperature range of 0-55°C. Power consumption is quoted at 4 mW per pin, per bit, per addressable cell. It is manufactured in the double-poly n-channel planar process, the memory features 16L compatibility on addresses, data, control, and power lines.



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LIMITED  
WILL BE EXHIBITING AT COMPEC



THE 7000 RANGE OF LOW COST BRITISH DESIGNED VISUAL DISPLAY TERMINALS WILL BE SHOWN



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## USER FORUM

# Leased hardware is user's responsibility

**USERS** are less aware than they ought to be of their obligations in the maintenance of their computer equipment, and some appear to remain ignorant of the fact that the hardware is their responsibility, whether purchased or leased.

This is the view of Max Eastwell, UK divisional general manager of Data Processing Customer Engineering, which last year scored a singular coup by winning British Airways' mainframe maintenance contract away from IBM.

"If leased," he says, "the equipment is still the responsibility of the user. He is responsible to management, which in turn is responsible to the lessor for its condition at the end of its term of use."

If the equipment is purchased outright, the user is responsible to management for an important capital asset, its

proper use and its length of useful life."

Eastwell calls the fact that these points are often overlooked the "rental syndrome," and explains how it came about. "Firstly," he says, "the equipment was rented by the supplier to the user, and all services were bundled in the rental price. The supplier took over from there, and the people in the user group normally responsible for the condition of inventory, for performance and so forth, were cut off from the responsibility for equipment."

"And they refuse to allow third party maintenance organisations to use diagrams and diagnostics."

Eastwell points out that the growth of mixed vendor sites means that the best way of getting round the problem of which supplier is responsible for a particular failure is to bring in a third party organisation for all maintenance.

He believes that, as in the motor car and aircraft industries, supplier-maintained computer equipment should be the exception rather than the rule.

"The UK government must act and act quickly to create a climate in which there is encouragement for the provision of better products and services at lower prices," he says.

"They themselves are stifled and constricted in their choice of services by the policies of their principal indigenous supplier. ICL refuses point blank to provide to independent maintenance companies the support services which should be provided. They will not provide access to diagnostics, spare parts or technical support."

"However," says ICL, "we have made a heavy investment in order to provide a comprehensive maintenance service designed to ensure that our customers have maximum use of their equipment at a competitive price."

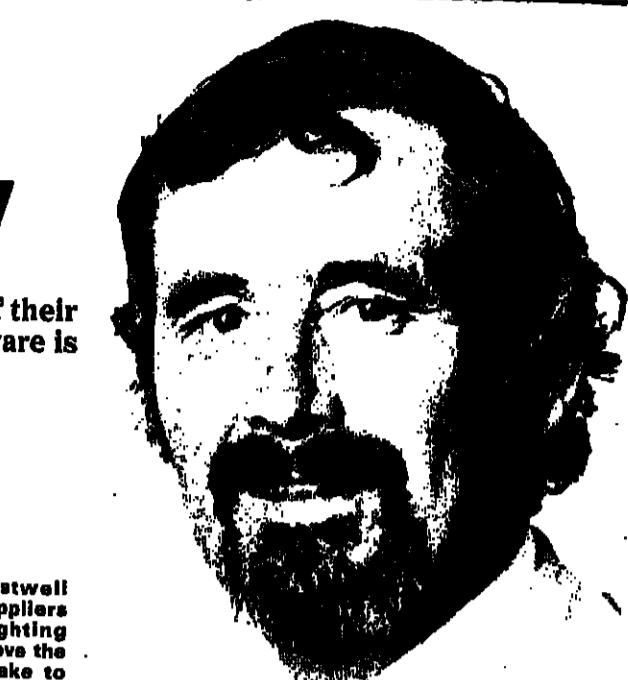
"The user has the right to choose who maintains his equipment, and independent maintenance organisations have the right to compete on equal terms with the supplier. But at present in the UK they cannot. I invite ICL to set a good example to the other equipment manufacturers: the company is strong and efficient enough to do so."

Eastwell acknowledges that many DIP executives now recognise their responsibility, but says suppliers are fighting every move the users make to try to get free.

"Only our engineers have the competence to fix our equipment, they say. Or only our people are motivated to care for your hardware as it should be. And then when the user still

has close contact with the main association. It has also talked as a group to Burroughs' regional managers and hopes to get official recognition by the company in the next year.

B1700 users or potential users in Scotland can contact the group through the secretary, A. F. Ramsay, DIP manager, William Grant & Sons, Park Road, Paisley. Telephone 041-8843211.



## ICL replies to Eastwell challenge

ICL has responded to the trenchant and challenging things said by Max Eastwell about ICL's attitude towards independent companies, with what regards as a full defence of its policies.

It also rebuts some of Eastwell's statements.

The company insists that it does recognise the right of owners, but not renters, of its equipment to choose an independent maintenance organisation, or to do maintenance themselves.

Even when the user moved on to purchased equipment next time around, the same attitude prevailed, according to Eastwell.

"Encouraged by the supplier, he still remained remote from maintenance aspects of his hardware, but now he was ignoring the cost-effective functioning of an important item of equipment for which he was now entirely responsible."

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## 'Go out and broaden your horizons'—NCC director

### USER VIEW

THERE has never been such a time of social, political and technical uncertainty in the computing community and data processing managers should go out and get a broader context in which to consider their tasks in order to take better decisions and enable their operations to respond sensibly to new situations.

This view is put by David Fimberg, director of the National Computing Centre and himself an ex-data processing manager, in the NCC's journal Interface.

"In an industry where both the technology and its applications are developing so rapidly that tomorrow becomes today before we have even noticed it, every one of us must occasionally get out of the cocoon of his immediate surroundings and take a long, hard look at where computing is going and the way in which he should guide the organisation employing him," writes Fimberg.

On the social and political front, computing is contributing to the changing relationship between management and labour, he says.

On the technical front, says Fimberg, new tech-

nologies like bubble memories, fibre optics and voice input are closer than we think. And there is a growing trend to focus data processing not on a mainframe but on an automatic switchboard as computing and communications converge.

Fimberg says these developments mean that the data processing manager is presented with a bewildering array of opportunities but still surrounded by a battery of constraints.

So Fimberg's message is: Go out and broaden your horizons, through courses, seminars and conferences. "We have ample opportunity to update our immediate surroundings and take a long, hard look at where computing is going and the way in which he should guide the organisation employing him," writes Fimberg.

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On the technical front, says Fimberg, new tech-

**Peripherals at cash and carry prices**

Digital ADM-3A DECwriter II  
Variable 30 cps terminal £950

TELETYPE Model 43  
new 30 cps 32 column printer £850

DEP 120 DECwriter II  
DEC 1000 printer 32 column  
line driver ADM-3A 30 cps  
28 VDU £1,600

Lev. Siger Mylar 3D disk  
KSR printer

### EX-STOCK DELIVERY

Peripheral Hardware Limited

Digital ADM-3A DECwriter II  
Variable 30 cps terminal £950

TELETYPE Model 43  
new 30 cps 32 column printer £850

DEP 120 DECwriter II  
DEC 1000 printer 32 column  
line driver ADM-3A 30 cps  
28 VDU £1,600

Lev. Siger Mylar 3D disk  
KSR printer

THE ICL 2903 and 2904 user base has moved upwards over the last two years and companies with turnovers of over £20 million now form 30 per cent of the users, compared with only 1 per cent in 1975.

This fact stands out clearly in a survey of the 2903 and 2904 market by the consultancy and software company Systemsolve (Computer Services).

Systemsolve's last survey, in September 1975, showed that the 2903 and 2904 had a 10 per cent share of the market.

Further signs of the increasing sophistication of users are in figures which show that fewer organisations regard ease of use, availability of packages and ICL support as important reasons for choosing the 2903 and 2904. And the percentage of installations using Cobol has risen from 44 per cent in 1975 to 63 per cent, while the number using RPG has increased from 60 per cent to 65 per cent.

The latest survey shows that 41 per cent are moving to a 2903 or 2904 from another computer and the numbers which previously used an accounting machine or a

ped considerably to 28 per cent and 18 per cent respectively.

Further signs of the increasing sophistication of users are in figures which show that fewer organisations regard ease of use, availability of packages and ICL support as important reasons for choosing the 2903 and 2904. And the percentage of installations using Cobol has risen from 44 per cent in 1975 to 63 per cent, while the number using RPG has increased from 60 per cent to 65 per cent.

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peripheral hardware limited

Digital ADM-3A DECwriter II  
Variable 30 cps terminal £950

TELETYPE Model 43  
new 30 cps 32 column printer £850

DEP 120 DECwriter II  
DEC 1000 printer 32 column  
line driver ADM-3A 30 cps  
28 VDU £1,600

Lev. Siger Mylar 3D disk  
KSR printer

THE ICL 2903 and 2904 user base has moved upwards over the last two years and companies with turnovers of over £20 million now form 30 per cent of the users, compared with only 1 per cent in 1975.

This fact stands out clearly in a survey of the 2903 and 2904 market by the consultancy and software company Systemsolve (Computer Services).

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# APPOINTMENTS

## HONG KONG

### PDP 11/70 PROGRAMMERS RSX-11M

Chartered on-line, Hong Kong's leading data processing service organisation, is seeking the services of experienced programmers to assist with installation of an on-line real time application using dual PDP 11/70 processors.

A two-year contract is envisaged. Benefits include an attractive salary and accommodation allowance as well as travel and relocation expenses. The maximum tax in Hong Kong is 15 per cent. Applicants should write to the Technical Manager, Chartered On-Line Ltd., Asian House, Hennessy Road, Hong Kong.

Interviews will be held in London during December, 1977.

## THE OPEN UNIVERSITY Faculty of Technology

### ASSISTANT SCIENTIFIC OFFICER IN DESIGN

An Assistant Scientific Officer is to be appointed within the Design Discipline, Faculty of Technology. The post is available from January 1, 1978. The successful applicant will be required to work in association with a small research team on a number of ongoing research projects concerned with studying spatial configurations and relational structures relevant to design in a variety of technological fields. A mathematical background in combinatorics and graph theory is desirable. The person appointed is expected to have a good computer science degree with specialist experience in using and writing combinatorial and graph manipulation algorithms in a range of languages including ALGOL 68 and PDP 11 ASSEMBLER. Several years' academic experience as a systems programmer on minicomputers with an interest in design applications is essential. Salary on the scale £2904-£4190 per annum, plus USS benefits (under review from 1.10.77).

Application forms and further particulars are available, by postcard request please, from: The Personnel Manager (S03), The Open University, P.O. Box 75, Walton Hall, Milton Keynes, MK7 6AL, or by telephone from Milton Keynes 63868. Closing date for applications, December 8, 1977.

## NEW BIRMINGHAM SALES OPPORTUNITIES

### Eurocom Data Limited

A member of the National Westminster Bank Group

### SALES EXECUTIVES

and

### SYSTEMS ANALYSTS

(To market COM in the Midlands)

Realistic on Quota earnings

### CIRCA £7000 + CAR

(Basic £4000-£5000 + Commission)

Eurocom Data Ltd. is a fast growing international Computer Output on Microfilm Bureau providing services through 5 centres in the UK and 8 further centres in Europe via Eurocom Data (Holdings) Limited.

Suitable candidates are likely to be successful VRC or Bureau Salesmen who have a good working knowledge of Computer and Business systems, and have consistently achieved Quota. However, we would be pleased to train experienced systems/programming Persons interested in moving to a sales environment.

Applications to:-

The Personnel Manager  
Eurocom Data Limited  
3 High Street, Rickmansworth, Herts.  
Tel. No.: Rickmansworth 74323

For application form quoting reference 82/1/81 to the Manager of Hydrology, Maclean Building, Croydon, Surrey CR0 1BB.

Write for application form quoting reference 82/1/81 to the Manager of Hydrology, Maclean Building, Croydon, Surrey CR0 1BB.

Staff Services Division of BOC Datavolve Group and

51, a member of Computing Services Association

# MANAGEMENT & EXECUTIVE SELECTION

## PROGRAMMERS up to £6½K GREATER LONDON

Providing good people to top companies has been the policy for this Buckinghamshire software house. The increasing demands for their high quality work have given rise to a need for more people but only the right people. Who are the right people? Well in this instance it is experienced commercial, mainframe work on customer premises, ensuring that systems are installed on time and without error.

Ideally they require programmers experienced on IBM equipment and conversant in COBOL, ASSEMBLER, or PL1. However, retraining will be given to other applicants. As the work is spread throughout the Greater London area it is essential that applicants are mobile, preferably possessing their own car. The demands of this job are more than met by the rewards, a high salary, travelling good time.

Ref. CW620

## SYSTEMS PROG to £4½K BRENTFORD

This is an excellent opportunity for a programmer with 1-2 years' experience of Assembler and possibly PL/1 to join a lively systems programming team. The vacancy has arisen through a rapid expansion in the use of data processing facilities which are based on a multi-processing 370/168 complex. The team is responsible for supporting the manufacturers software, which includes IBM's most advanced operating system, a TP network running under CICS and a time sharing service. Initially you will be working in one of the areas mentioned, but you will have an opportunity to gain experience in all areas. Training will be provided where necessary. Our client is a UK owned multi-national company manufacturing a wide range of consumer products. If you are looking for good career prospects using the most modern and sophisticated equipment in a very friendly atmosphere, this position is ideal.

Ref. CW624

## SUPPORT ANALYST £5½K LONDON & THE NORTH + Car + Bonus

A manufacturer's success depends on its products and its people. Our client, an international mini computer manufacturer offer the most wide ranging compatible product line available from any company today. Their processors range from micros to powerful medium sized computers. These are backed by a vast selection of peripherals, and of prime importance, a comprehensive range of software. The people they require are support analysts to work a pre-sales role. This is not a desk job. Most of the time will be spent working alongside the salesforce to provide their customers with necessary software expertise and part of the job. An in-depth knowledge of mini computer system software, ASSEMBLER and COBOL and/or FORTRAN. Special systems experience in communications or database techniques would be advantageous. As well as positions based in W. London this company also seeks staff in Birmingham and Manchester.

Ref. CW626

## SENIOR PROGS to £5K WEMBLEY

Our client, an engineering company whose name is known and respected throughout the world, require experienced programmers. These vacancies are ideal for those people who have a good knowledge of COBOL and want to progress into a position of responsibility. Experience on IBM 370 equipment under DOS/VIS would be preferable, but not essential. You would be assisting the Chief Programmer and a Systems Analyst in planning, writing and testing programs on both industrial and commercial applications. These include production control, order processing, stock accounting, ledgers and payroll. As the programming staff work as a team to cover all projects and have a close working relationship with the systems analysts, the work is both varied and interesting. Career progression into the systems area is actively encouraged. The company provides a subsidised canteen and an active sports and social club operates nearby. That, coupled with extremely pleasant, modern office accommodation, makes this a very worthwhile opportunity.

Ref. CW621

telephone 01-637 9611

## ANALYST PROGS £5-9K MIDDLESEX

Our client has style, company style. Its unique way of operating has helped it to become the largest independent computer service company in Western Europe. It is wholly owned by its employees each person being directly responsible for its sales success and as far as possible acting as their own boss, while at the same time, being part of an enthusiastic and extremely sociable young team. Due to the continually increasing workload they require analysts and programmers with commercial, accounting or financial systems experience. It is essential that applicants have had responsibility for the installation of at least one system. Programming experience may be in either high or low level languages; COBOL or Assembler are preferred. The considerable customer liaison involved in this job demands a business-like appearance and attitude. Most of the work is local and thus development done in-house, nevertheless applicants should be mobile. High salaries, top working conditions and every opportunity for promotion are given in return for hard work and enthusiasm.

Ref. CW622

## LECTURER £5K HERTS

The chance to set up and run an entirely new training department is offered by our client, a small but thriving mini computer manufacturer. They offer a wide range of courses including Assembler level programming, operator training and computer appreciation at manager level. These are given to both customers and staff at the company's brand new premises, just 15 minutes by train from central London. The successful candidate will handle the entire training function, booking in the courses, arranging accommodation, designing and preparing new courses material, presenting the courses and writing course reports.

This is extremely rewarding and stimulating work involving a high degree of personal contact at all levels as well as considerable responsibility. It is essential that candidates have a background in programming and ideally have had lecturing experience. Above all they must have the right personality and attitude — outgoing, able to easily communicate ideas and hard working.

Ref. CW623

## AN INVITATION WITH A DIFFERENCE

Are you looking for a new job? Do you seek change but not a move? Look no further the solution could well be on your doorstep.

We are currently working on behalf of several top companies in NW London. They comprise manufacturers, software houses, bureaux & users. Between them they seek programmers, analysts, support staff, lecturers and consultants. Some indication of the standard and variety of vacancy may be seen on this page. In order to make it easier for you to discuss these and other vacancies in your area we are coming your way next Wednesday. Drop in and see us during the day or on your way home. Let us find you a new job for the New Year.

## WE ARE COMING TO SEE YOU!

MEET OUR CONSULTANTS  
at the LONDON EUROCREST HOTEL

next to the Wembley conference centre

on WEDNESDAY, 30th NOVEMBER  
any time between 12 NOON and 9 PM

If this is not convenient then phone Rowland Middleton or Pam Quinlan on 637 9611, quoting job reference number

## SENIOR PROG to £5½K LONDON N.W.10

This senior position would be suitable to someone with very good COBOL experience. As you may be required to supervise a team of less experienced programmers, you should be able to show experience or ability in this area. You will be responsible for program design and specifications and will also be expected to communicate with users. The company, one of the largest food groups in Britain, operate extensive real-time on-line systems, linking their warehouses, factories and distribution depots with the central computer. They have just completed the design of the first part of a stock accounting and control system which they are going to integrate into their existing order processing and ledger accounting systems. You would be involved with programming this new system and assisting in its development for the future. Career progression is encouraged and regular training courses are arranged to provide the necessary skills. The company also has vacancies at a programmer level.

Ref. CW627

MANAGEMENT &  
EXECUTIVE SELECTION

# SPOTLIGHT ON N.W. LONDON

## SALES SUPPORT £5½K + Car HARROW

Simplicity of operation, has proved a successful concept for our client, the first international company to develop and manufacture a purpose built Key to Disc System. They have maintained this concept with their new micro processor based, multi user, distributed processing system, which for ultimate ease is user programmable in ANSI COBOL. To support their busy sales force they require outgoing presentable young persons who would enjoy the demands of working in a fast moving environment. There is continual customer involvement both in pre and post sales support. You will need the necessary experience to undertake systems analysis proposals, demonstrations as well as customer training both in house and on site. The systems installed are all commercial and written in COBOL, a comparable background is essential. This is a great opportunity to put your programming and systems skills to good use while furthering your career in the more stimulating, varied and rewarding support environment.

Ref. CW625

## SOFTWARE PROG £5½K ACTON

If you have a thorough knowledge of IBM Assembler and are looking for the opportunity to work on software, this position would be of great interest to you. You will be working with the systems programmer on a variety of interesting software packages including an on-line program development system, an expanding TP network, a DOS/VIS operating system and future development of a database system. Experience of these sophisticated systems is not necessary as training will be provided. Suitable candidates would be mature, responsible people who have probably reached a senior programmer level.

Our client, who organise and manage community resources, offer job security, steady career prospects and an attractive range of fringe benefits. These include 5 weeks' holiday, flexible working hours, and interest free season ticket loans. They will also provide 100% removal expenses, pay legal fees up to £300 and in suitable cases, lodgings allowance.

Interesting work together with attractive fringe benefits make this an excellent opportunity.

Ref. CW629

# MYRIAD APPOINTMENTS LIMITED

Computer Personnel Consultants

## PERFORMANCE MEASUREMENT

### NEAR READING

£6000-£8500

A lot of people reading this advertisement will be able to tick one or more boxes in the first four columns. The fifth is the problem. If you can tick one or more in the first four and one or more in the fifth we can virtually guarantee that our client would like to interview you.

Equally important, we think you would like to interview him.

1 Have you held a position as:	2 Are you currently earning circa:	3 Have you had experience with:	4 Are you interested in:	5 Are you capable of working on:
<input type="checkbox"/> Systems Analyst	<input type="checkbox"/> £3,000	<input type="checkbox"/> CORAL	<input type="checkbox"/> An excellent relocation package	<input type="checkbox"/> Data Transmitters
<input type="checkbox"/> Software Engineer	<input type="checkbox"/> £3,250	<input type="checkbox"/> ASSEMBLER	<input type="checkbox"/> Golf	<input type="checkbox"/> Digital Switching
<input type="checkbox"/> Programmer	<input type="checkbox"/> £3,500	<input type="checkbox"/> Low Level Languages	<input type="checkbox"/> More money	<input type="checkbox"/> Systems/Software
<input type="checkbox"/> Group Leader	<input type="checkbox"/> £3,750	<input type="checkbox"/> Real Time Systems	<input type="checkbox"/> Surfing/Skin Diving	<input type="checkbox"/> Diagnostic Software
<input type="checkbox"/> DI Manager	<input type="checkbox"/> £4,000	<input type="checkbox"/> Living in the warmest part of the UK	<input type="checkbox"/> Device Handlers	<input type="checkbox"/>
<input type="checkbox"/> Applications Engineer	<input type="checkbox"/> £4,250	<input type="checkbox"/> Spilling	<input type="checkbox"/> Logic Circuit Design	<input type="checkbox"/>
<input type="checkbox"/> Computer Maintenance Engineer	<input type="checkbox"/> £4,500	<input type="checkbox"/> Housing at reasonable prices	<input type="checkbox"/> Microprocessor applications	<input type="checkbox"/>
<input type="checkbox"/> Test Engineer	<input type="checkbox"/> £5,000	<input type="checkbox"/> DEC	<input type="checkbox"/> Fishing	<input type="checkbox"/> Telecommunications
<input type="checkbox"/> Circuit Designer	<input type="checkbox"/> £5,500	<input type="checkbox"/> A variety of opportunities	<input type="checkbox"/> Analog/Digital Systems	<input type="checkbox"/>
	<input type="checkbox"/> PIP250			

We realise that we have used some cliché words/phrases like "opportunities" and "housing at reasonable prices," which appear in a lot of other ads. But they happen to be accurate. The opportunities exist at graduate, assistant, senior, principal and chief engineer levels over wide fields of activity involving commercial or defence applications.

The location is the coast in the West Country.

If you have read this far, it should be worth the time - and the price of the phone call - to speak to John Nolan on 01-638 1891. He will give you all the extra information you need and will make sure that if you are interested you aren't kept hanging about for weeks.

Richard Owen Advertising  
56 Moorgate, London, EC2

# SYSTEMS ANALYSTS

A Vital Rôle in Telecommunications

The Management Services Division of Cable and Wireless is engaged in the development of systems used to support our international telecommunications activities. We are planning a number of major projects involving the use of mini- and micro-computers, database techniques and distributed processing. We need experienced Systems Analysts to work with teams of programmers on these projects. You must be prepared to undertake some foreign travel, mainly to the Middle East.

Sound experience in all aspects of systems analysis and design is essential; good business sense coupled with a strong personality is important.

These appointments represent opportunities to build successful and rewarding careers with us. Commencing salaries will be at least £5,000. In addition, a wide range of benefits, including foreign travel allowances, are applicable.

To discuss these appointments, ring Howard Yates on 01-242 4433 extension 4595. If you prefer, write with brief career details to:

Recruitment Manager,  
Cable & Wireless Limited,  
Dept. A684(e)782,  
Mercury House, Theobalds Road,  
London WC1X 8RX.

The Cable and Wireless Group — comprising over 40 companies operating in 70 countries — is the world's largest international organisation supplying telecommunications services and facilities. Systems and services embrace space, radio, cable, telephone and specialised networks; broadcasting and television, telephony, telex, Islex, facsimile and data.

**Cable & Wireless**  
Leaders in International Telecommunications



### WEBBEX REGIONAL HEALTH AUTHORITY

### DATA PREPARATION TEAM LEADER

Required for our Computer Centre at Wimborne, Winchester. Applications are invited from suitably qualified and experienced persons to be responsible for the Data Preparation Supervisor for a small team of Key System Operators. Candidates should, ideally, be experienced in Key to Disc.

Good working conditions and career prospects available.

Salary Scale Supervisor H, £2,820 rising to £3,058 inclusive of supplements.

Job Description and Application Form available from the Personnel Department, Highcroft, Romsey Road, Winchester, Hants SO21 1RL. Closing date: 25th November, 1977.

### LOWFIELD (STORAGE & DISTRIBUTION LTD.)

### REAL-TIME PROGRAMMER

Up to £3,760 p.a.  
Daventry, Northants

Lowfield, a subsidiary of Imperial Foods, provides a national food delivery service based on major warehousing and distribution depots throughout the U.K.

At our Daventry Headquarters we have a small but growing real-time computer system using a distributed network of Data General Computers.

We are now seeking to strengthen this department with a few women, preferably with two years' job related experience.

Please write giving details of age, qualifications, experience and present salary to: Personnel Director, Lowfield (Storage & Distribution) Ltd., 4-6 Chelverton Road, Northamptonshire.

# Tired of your good ideas going down the drain? Not as a Systems Analyst with OSMA Plastics

Our client is Wavin Plastics, whose OSMA range of plastic building and drainage products are recognised market leaders. They have asked us to recruit a Systems Analyst for them at a salary of around £5,000 — someone who wants to become involved with the development of On-Line systems.

### PROSPECTS

So many systems jobs don't really lead anywhere at all. This one does, and we can substantiate this by saying that if you have between one and two years' systems experience and you want to move into the development of On-Line systems, then have a look at Osma Plastics. They are in the forefront of their industry, a stable, growing company utilising the latest computer techniques, constantly satisfying the need of an extremely demanding management, but creating for their own computer staff some exciting technical opportunities.

So what must you offer in return? At least one successful system, be enthusiastic, enjoy your work, be creative and like working with a minimum of supervision.

### LOCATION

Wavin Plastics are based just outside London, not very far from London Airport, an area which is easily commutable to from extremely reasonably priced housing areas, which are also without doubt, some of the nicest areas to live in, in Southern England.

### TO APPLY

Please apply to John Goldsmith by ringing 01-828 5356 during normal office hours, or outside normal office hours on Camberley 21266. Alternatively, please ring John Quenby, DP Manager for Wavin Plastics on Bedford 741220. Ref. 1057.



Computing  
Services  
Association

WE ARE ALWAYS INTERESTED IN HELPING YOU WITH YOUR CAREER  
John Goldsmith (Computer Recruitment) Ltd., 15, Buckingham Palace Road, London, S.W.1.  
Tel: 01-828 5356—24 hour answerphone service.

**JOHN GOLDSMITH** (Computer Recruitment) Ltd.

JBA

### Senior Consultant

#### Sales Division Herts

package £9000 + car

A highly successful computer manufacturer is seeking to appoint a senior member for a team which is totally responsible for the company's larger systems sales. Candidates will be able to demonstrate previous experience of project control, probably in a post sales support role; have the ability to identify customer requirements, co-ordinate resources, and deal positively with clients. Proposal writing and presentations are both considered important aspects, an understanding of Distributed Processing, DBMS applications and experience on large mainframe machines would be a distinct advantage.

Excellent career potential.

Contact Margaret Stevens

### Systems Consultants

#### London and Home Counties

up to £7250

Our client, one of the largest software houses in Europe, has vacancies for systems staff to work on a variety of projects in the South of England. Applicants must have at least four years' in systems analysis and design and several years in programming. Experience of commercial applications using mainframes and minis would be ideal.

Excellent salaries and opportunities.

Contact Jim Baker

### Chief Programmer (RPG 2)

#### Central London

circa £8000

A large commodity trading company with an IBM installation seek an experienced RPG 2 programmer looking for a senior post. Duties will be to supervise programming and operations staff, maintain and ensure adherence to standards and liaise closely with Systems Analysts. The likely applicant will probably be between 24 years and 30 years, progressive, self assured and capable of dealing at all levels. Excellent prospects.

Good opportunity for right person to really establish a career path.

Contact Mike Creamer

For further information on any of the above vacancies please contact the appropriate consultant. If your qualifications do not match the above positions but you are seeking other opportunities please contact us anyway.

neg. circa £6000

### Systems Engineer/Analyst

#### West of London

Applications are invited from those who can make an immediate contribution in a demanding technical role. In order to qualify for this job it is essential that candidates have experience of commercial or manufacturing applications and be able to demonstrate a thorough knowledge of an Assembler level language. Specialist skills, such as real-time development on minicomputers will be highly valued. This is a chance to work on possibly the most advanced manufacturing control system outside the U.S.A.

An excellent opportunity for the ambitious technician to join a small but highly professional team.

Contact Margaret Stevens

### Minicomputer Programmers

#### Berkshire

c.£5750

A large and well established British company has outstanding opportunities for programmers to work on the development of sophisticated real-time systems. Candidates must have at least one year of programming in either Assembler, CORAL or FORTRAN on technical or commercial applications. Experience of real-time projects would obviously be an advantage. These vacancies offer the chance to work with a professional team using new techniques for advanced systems.

Salary according to experience. Generous fringe benefits and relocation assistance.

Contact Jim Baker

### Australia

Approaching summer, very high standard of living, good salaries, and varied unparalleled opportunities must make Australia an attractive prospect at this time. If you are seriously considering a move, contact us for full counsel and help in locating a good career situation. Currently in urgent demand: Honeywell 6000 or Level 68 personnel; CICS expert; IBM COBOL Programmers.

Contact Mike Creamer

### JAMES BAKER ASSOCIATES

#### International Personnel Consultants

16 Maddox Street, London W1. Tel: 01-491 4478

**WEST YORKSHIRE**

**SYSTEMS ANALYST** To £4500 + car  
General commercial systems experience required. Must have higher educational qualifications, preference will be given to people with manufacturing systems experience.

**SENIOR ANALYST/PROGRAMMERS**

£4300 + Review  
Medium size installation running ICL hardware requires two senior analysts/programmers for commercial applications. Good career prospects.

**ANALYST/PROGRAMMER** To £4400  
This manufacturing company are seeking a well experienced COBOL programmer who has had some systems design experience and would like to further it. High proportion of new development planned.

**PROGRAMMER/ANALYSTS** To £4900 incl. Bonus  
Major software house requires additional staff for new contracts. Medium to small mainframe COBOL experience required. Dedication and effort are rewarded in cash.

**MAINTENANCE PROGRAMMER** To £3900 + Review  
Maintenance and development work in medium installation. Preference for people with some systems knowledge.

**PROGRAMMER** To £4500  
Large installation requires ANS COBOL programmers. Preferably with Data Base experience in a CICS + Batch environment. Excellent opportunity in a growing installation.

These are representative vacancies only. Telephone for further information of these and many more in the north of England.

QUEENS ROAD MILLS, QUEENS ROAD  
HALIFAX HX1 1LR. TELEPHONE: HALIFAX 0422 68232

**SCHOOL EXAMINATIONS DEPARTMENT  
UNIVERSITY OF LONDON****PROGRAMMER  
UP TO £5,261 Inclusive**

- \* Salary scale: £2804-£4811 plus £450
- \* Six weeks' annual leave, plus official Bank Holidays and six public holidays
- \* Interest Free Season Ticket Loans
- \* Membership of the Universities' Superannuation Scheme

Applications are invited from programmers with at least eighteen months' experience in PL/I and preferably with a working knowledge of COBOL to join a team of programmers responsible for the processing of the University's GCE Examinations in U.K. and Overseas. An ICL 19031 computer is used and processes information stored both on disc and magnetic tape files. Applicants should be familiar with GEORGE operating systems.

Application forms and further particulars from Miss Jene Ritchie, School Examinations Department, University of London, 86 & 92 Gower Street, London WC1E 8EE, Tel. 01-836 8000 Ext. 80. Closing date for applications is 8th December, 1977.

**Computer Operator****TIRED OF COMMUTING?  
BORED WITH YOUR SURROUNDINGS?**

If your answer to these questions is 'yes' take a look at what Excess can offer . . . you may find you are in for a pleasant change.

Salary circa £3,600 including shift allowances plus:

Modern offices in delightful surroundings  
Non-contributory pension fund and life assurance  
Lunch vouchers and subsidised canteen  
Mortgage subsidy after a qualifying period of service.

Excellent sports and social facilities where you can meet lots of friendly new people.

We are operating an IBM 370/138 and presently developing teleprocessing and data base systems. We need someone with at least six months' experience gained on IBM equipment with knowledge of DOS VS and GRASP/POWER willing to work on a shift basis.

If you are interested please write or telephone:

Irene Northcott, Personnel Officer  
Excess Insurance Group

The Warren, Warren Road, Worthing  
West Sussex BN14 9QD  
Telephone Worthing (0403) 38933

**Watch this space for details of the next Square One Open Evening on 5 Dec.**

Come and talk to us over a beer and a sandwich, and discuss worthwhile opportunities in a company where skills and hard work really count.

150 Regent St, London W1



Square One Computer Services Ltd 02405 74181

**SENIOR PROGRAMMER C. £7,500**

LONDON, S.W.1  
An experienced COBOL programmer ideally with FORTRAN and/or ASSEMBLER, and with in-depth knowledge of the IBM/DOS operating system is required. The ability to manage a small programming team and generate original thought in the areas of systems and programming standards and efficient machine usage, would be advantageous.

**SENIOR SYSTEMS ANALYST C. £6,500**

SOUTH BUCKS.

A large manufacturing group with continuing expansion of their data processing activities, requires a senior person to help them move into a multi-programming environment. This vacancy could provide the opportunity for advancement within the group.

**TRAINING OFFICER (OPS) C. £5,000 HOUNSLAW**

The position would suit a mature person with communicative skills and good IBM/ICL operating exp. wishing to come off the shift system. If you would like a more responsible position with a sophisticated company, imparting your operator skills and co-ordinating training schemes, please contact us.

Please phone for an application form for the above vacancies or for information about a job to suit you.

Don't make an appointment just arrive.

Apply in the first instance to Mr. W.L. Robinson, Ferranti Limited, Simonsway, Wythenshawe, Manchester M22 5LA giving brief career details (quote reference WD15/CW).

**AMES PERSONNEL**

TELEPHONE: 01-757 0611.

**BUSINESS SYSTEMS ANALYST  
LONDON WEST END**

Mills and Allen International Limited, a large group of companies with interests in poster and cinema advertising, money broking and printing require an analyst to assist the Systems Development Manager in the introduction of new Methods and expansion of existing computerised systems.

The group already uses several bureau facilities to provide its computing power, and plans are being formulated to expand into on-line enquiry systems within the next year. In addition one of the group companies will be acquiring an in-house computer due to be live in July 1978.

Future development plans are extremely varied, and the successful applicant will be expected to design, formulate and implement the correct computer solutions for the appropriate business requirements.

Qualifications are not rigidly defined for this post, but the successful applicant is not likely to have had less than three years' analysis experience, preferably with a strong commercial background and some knowledge of on-line computing techniques.

A salary in the region of £6500 can be expected with further increments negotiable for applicants with the necessary experience.

For further information write to Chris Ryan, Systems Development Manager, Mills and Allen International Limited, Buchanan House, 24-30 Holborn, London EC1N 2JY, or telephone 01-580 5555.

# Manchester Computer Project Staff

**Project Managers**

We are seeking two project managers, one to handle industrial process control projects, the other to handle projects involving data communication networks. Our project managers take responsibility for all aspects of a project. Internally they are responsible for co-ordinating resources, managing the engineering and software teams assigned to the project and meeting the performance specification within the planned time scale. Externally they provide the main link between the customer and the Company. These are senior appointments. Applicants should have a good scientific or engineering background and substantial experience of real-time computer applications in a relevant field, either a supplier or a large user.

**System Designers/Programmers  
Project Engineers**

We have vacancies at senior and intermediate levels for a number of system design, programmers and project engineers to join project teams, handling real-time computer applications. These are attractive openings for competent professionals who are looking for technical challenge and advancement. Candidates should have at least two years' experience in real-time field and successful applicants are likely to have a degree in computer science, mathematics, physics or engineering. Successful staff in these categories can expect to progress quickly into senior systems or project management positions.

**Technical Authors  
(equipment and software)**

Good technical documentation—design specifications, operating manuals, programming manuals, maintenance manuals—is essential to the success of any advanced computer project. Our technical authors gather information first hand as full members of the integrated engineering and software project teams and are responsible to the Project Manager for writing all the technical literature with a minimum of supervision.

Self-motivation, a logical mind and the ability to write clear concise English are most important, though formal qualifications although most of our best authors do have a good academic background. Naturally, experience in computer software or engineering would be an advantage but we are prepared to provide training for candidates from other disciplines who are otherwise suitable.

FERRANTI LIMITED is a wholly British Company. We design and manufacture the ARGUS 700 range of computers and are European market leaders in supplying real-time industrial process control and on-line data communication systems.

Being system suppliers as well as equipment manufacturers our staff are able to see projects as a whole and the interactions between hardware and software design are within their control. Professional development is encouraged.

Competitive salaries will be offered. Generous relocation allowances are available.

Our offices and laboratories are in a pleasant part of South Manchester, close to very good residential areas.

Apply in the first instance to Mr. W.L. Robinson, Ferranti Limited, Simonsway, Wythenshawe, Manchester M22 5LA giving brief career details (quote reference WD15/CW).

Real Time People

LIVERPOOL: Adelphi Hotel, Tuesday 29th November 4.30 pm-8.30 pm

STOKE-ON-TRENT: George Hotel, Burslem, Thursday 1st December 4.30 pm-8.30 pm

LONDON: Charing Cross Hotel, Monday 5th December 4.30 pm-8.30 pm

WATFORD: Beehive Hotel, Tuesday 6th December 4.30 pm-8.30 pm

Don't make an appointment just arrive.

Computer Services Association

ASSYST

Computer Services Group

SALARY UP TO £9,000 PER ANNUM

ANALYST/PROGRAMMERS

Experience IBM SYS/3 (and preferably IBM 370) with programming experience of RPG II and COBOL.

Three of these positions are for our office in Al Khobar, Saudi Arabia, where benefits include:

★ Tax free salary

★ Free housing

★ Free Medical and Insurance

★ Free Transportation

★ Free air fares to U.K.

The other position is for our Branch Office in Amstelveen, Netherlands.

ASSYST is the leading computer bureau and consultancy group of companies operating in Saudi Arabia and Gulf and has offices in Riyadh, Al Khobar, Dubai and Amstelveen. The company has grown considerably in the past three years and offers a D.P. professional the opportunity to grow with it.

Please send your C.V. (or a brief letter outlining your experience) to:

Mr. A. Mordain

82 Kingsway

South Shields

Tyne and Wear NE33 3NJ

or telephone 0632 568273, after December 1st

Please quote reference B.748. Closing date: 9th December 1977.

London Boardroom

Waiting Room

REF. NO CW/11/24

INTERVIEWS — NEW YORK,  
USA

IBM O.S. COBOL  
ANALYST PROGRAMMERS

One of the most prestigious consulting companies in America has vacancies for several high-calibre Data Processing Professionals, who will be assigned to one of several locations in the USA, including major cities and semi-rural areas. In the States, Analyst Programmers are expected to demonstrate ability in a broad range of skills — user liaison, analysis, program design, coding, testing and documentation. For these vacancies OS COBOL is mandatory; any experience in specialist areas, such as IMS, CICS, PL/1 would be of particular interest to our client. Standards of selection will be very high, but candidates who are short-listed will be flown to New York's Kennedy Airport (at our expense) and taken to our client's office for a final interview. An excellent salary package will be negotiated.

Contact: LINDA BENSTED

INTERVIEWS — NEW YORK,  
USA

IBM O.S. COBOL  
ANALYST PROGRAMMERS

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Contact: MARILYN DAVIDSON

INTERVIEWS — NEW YORK,  
USA

IBM O.S. COBOL  
ANALYST PROGRAMMERS

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USA

IBM O.S. COBOL  
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**MIDLANDS****A KEY ROLE IN — PROJECT MANAGEMENT****Salary £6,500 p.a. + Fringe Benefits**

We have been asked by our clients to identify a Project Manager to work in their dynamic and developing environment. Applicants should be capable of developing, implementing and maintaining financial computer systems, utilising large IBM 370 series hardware, supporting increasing CICS on-line, and IMS data base systems.

Owing to the increasing scope and facilities at our clients Computer Centre the position offers exceptional challenge to imaginative computer professionals.

Candidates should be:  
 \* capable of demonstrating management and technical skills in a financial systems environment.  
 \* a graduate, or professionally qualified.  
 \* able to achieve results through people.

Working conditions and fringe benefits are excellent including generous relocation expenses.

CONTACT CATHY TRACEY, 021-236 3781

REF. NO. CW/11/21

**SPECIALIST COMPUTER RECRUITMENT LTD.**  
**BIRMINGHAM 021-236 3781 FREEPOST**  
 Freepost, Equity and Law House, 35-37 Great Charles Street, Queensway, Birmingham B3 2BR  
**MANCHESTER 061-833 0676 FREEPOST**  
 Freepost, Corn Exchange Buildings, Corporation Street, Manchester M4 8BD  
**LONDON 01-935 0671 FREEPOST 6**  
 Freepost 6, 202, Blandford Street, London W1E 1JZ

**SCR**

**PROGRAMMERS**  
 SOUTH COAST COBOL OR ASSEMBLER c (4200)  
 Phone 01-439 8481 (24 hours)  
**EFFECTA GRAVIS**  
 Personnel Consultants

**CAPITAL APPTS.**  
**FORTRAN PROGRAMMERS**  
 Urgently required for Industrial and Scientific Development £3,000-£8,000  
 Telephone for free list of VACANCIES  
 £37 555/day; £36 9659 eve.

## Technical Support Manager Designate

c. £8,500 p.a. plus car

RTZ Computer Services is an independent company within the RTZ Group concerned with the development of computer-based financial systems.

The rapid expansion of the time-sharing division of this company has created the need for further technical support. Reporting to the Sales Manager the person appointed will be required to provide technical support for the sales team, organise customer training and generally assist in the resolution of clients' technical problems, both for pre- and post-sales.

Candidates should have a sound financial background with a working knowledge of FORTRAN and some experience of BASIC.

Ideally we are looking for someone in his or her late 20s who is carrying a similar range of responsibilities at present. We are also willing to consider applications from less experienced persons who are looking for an opportunity to grow with an expanding company.

**RTZ Computer Services** a member of the RTZ Group

Please apply in writing giving age, career to date and present salary or phone for an application form to: Philip W. L. Mar, RTZ Computer Services Ltd, 103 Jermyn Street, London SW1. Tel: 01-830 4183.

**Shift Leader**

Required for a rapidly expanding ICL twin 2804 installation with local and remote communication systems.

Applicants should have 3 years' operating experience, with a minimum of 1 year on ICL equipment, and be prepared to operate on a three-shift role.

Our terms and conditions of employment are excellent and include 4 weeks annual holiday, subsidised dining facilities, bonus and pension schemes, and an active social and sports club.

Applications should be made in writing to: Miss G. A. Weston, Personnel Officer, BDH CHEMICALS LTD., Broad Road, Poole, Dorset BH12 4NN.

**QUADRANT RECRUITMENT****OPERATIONS MANAGER NEW 2903****YORKSHIRE****to £5500**

Our client is seeking an unusually capable operations person to set up and run two new ICL 2903 installations that will eventually have an extensive communications network attached. The main installation, where the position is based, is between Huddersfield and Sheffield.

It is likely that the successful applicant will be experienced on ICL equipment and will have worked in a communications environment. Previous management or shift-leading experience will be necessary, together with the ability to grow with the use of data processing within the company.

Salary and conditions of service are excellent, and assistance with relocation to this delightful rural location will be given if necessary.

Bank House, Queen Street, Sheffield, S1 1UF.  
 Tel: Sheffield (0742) 738794.

**COBOL PROGRAMMER****S.W. LONDON****TO £4,900**

A competent COBOL Programmer is required to work in close to bus, main line and tube services. ICL 1902T hardware is operated under GEORGE II. A variety of financial and accounting systems are run using both batch and on-line enquiry techniques.

Work will be in project groups which are structured to allow personal progression. Knowledge of PLAN, GEORGE II, or FILETAB would be valuable but the essential requirement is the ability to produce working COBOL programs within realistic schedules. Training will be provided where necessary.

Benefits include — FLEXITIME, SEASON TICKET LOAN, PAID OVERTIME, EXCELLENT HOLIDAYS, COMPREHENSIVE PENSION. For 2 years' experience salary will be negotiable up to £4,900.

If you would like to join a small, professional yet friendly team, then telephone our CROYDON office or write quoting ref. CW66-7H.

01 686 9693 (24 HOUR ANSWERPHONE) | 061 236 2419 FAULKNER HOUSE  
 11 PARK STREET | CROYDON CR0 1TF | FAULKNER GATE, MANCHESTER M14 7D

**CAPP ASSOCIATES**  
 COMPUTER AND PROFESSIONAL PERSONNEL CONSULTANTS

## Computer Programmer/Analyst

North Sea Oil-Aberdeen

Occidental, the operators for the Piper and Claymore North Sea oilfields, are committed to a continuing programme of expansion and development.

Our small and highly skilled team of computer specialists play a significant role in providing technical and commercial data processing services to the entire operation.

The increase in these activities has created an opportunity for an experienced Programmer/Analyst who can take on the complete responsibility for various new technical applications, which range from helicopter scheduling to contour mapping. Candidates, male or female, should be familiar with time-sharing and data-base

techniques and have had a minimum of four years' experience as a Computer Programmer.

Initiative and enthusiasm will be readily encouraged and our progressive approach to technical innovation guarantees a stimulating working atmosphere. A competitive salary is offered along with the benefits expected from a major oil company.

If you believe you match our requirements and are seeking a challenging and rewarding career, please write with brief details to:

Mrs Ann Reynolds, Occidental Petroleum Inc., 127 Causeway, Scotland Inc., 127 Causeway, Aberdeen AB2 3TP.

Applications should be made in writing to: Miss G. A. Weston, Personnel Officer, BDH CHEMICALS LTD., Broad Road, Poole, Dorset BH12 4NN.



# Berlei plans new ICL 2950

## Analyst/Programmers Programmers

**Slough**

Berlei require you to have a minimum of 2 years' programming experience using COBOL on any machine; some exposure to analysis would be welcome but by no means essential. Above all, if you really wish to be involved and to contribute to the well-being of your business, at the forefront of software design, join Berlei and its ICL 2950.

Salary will not present a problem to the right applicants and training will be provided as necessary.

In the first instance please contact John De La Mere on 01-549 3212 for further details.

## Future Systems Data Base Real Time Distributed Processing

Cobol programmers are required in the West End. One of the most interesting and rewarding openings for mainframe programmers in recent years has arisen.

A major international company is on the threshold of a five-year development programme and wishes to recruit the first phase of its programming intake.

Already an existing IBM user, they will have to upgrade their 370 to cope with their Data base, Real time, and Distributed Processing systems development.

This ground floor opportunity is open to applicants with a proven record of Cobol programming on any machine.

Competent COBOL programmers will not find the salary a problem and will enjoy the benefits of working for a prestige company with technical training, career progression into analysis and management in addition to probable overseas travel to consult with users.

To secure an interview, please telephone 01-549 3212 and speak to Clive Hartrup.

## Sussex Coast Cobol Programmers c. £4800

Are you tired of City life? Would you like a place by the sea? If so a bracing atmosphere awaits you in the south. You could join a development team in an interesting and stimulating environment. You can use your COBOL knowledge in the development of commercial and manufacturing systems.

Our client is embarking upon a significant upgrading of its D.P. facilities including an orientation towards management information systems. They offer excellent benefits and prospects as part of a progressive group, including relocation assistance where appropriate and a profit sharing bonus scheme.

Ring Stella Mitchell immediately to arrange your interview.



KINGSTON: 44 Wood Street, Kingston upon Thames, Surrey England. Telephone 01-549 212 (24 hours). Telex 27950.  
 DUBLIN: Cambern House, 24 Lower Leeson Street, Dublin 2. Telephone 762170/762188/765602. Telex 30742.  
 AMSTERDAM: Riversdale, Amsteldijk 166, Amsterdam 1010. Telephone 461844. Telex 11336.

## Computer Appointments

**MOVE INTO SOMETHING NEW!!****PROGRAMMERS—ANALYSTS—SYSTEMS ANALYSTS £4,000-£5,500**

A major food manufacturer has a requirement for the following people

**JUNIOR ANALYSTS/SYSTEMS ANALYSTS:** These positions offer the opportunity to move into support and development areas of batch and on-line applications. If you are familiar with an IBM environment and are interested in the latest developments of on-line and database techniques, this could be the opportunity you have been waiting for.

The company currently uses IBM 370/148 and 145 mainframes with on-line database facilities, in a friendly and professional environment. Their modern premises are situated in the most picturesque rural surroundings in an easily accessible area of Surrey. If you feel that the time has come for you to enter a dynamic environment, where with the right training you can make a positive contribution to the company's expansion, then ring us for a preliminary discussion on 01-439 6299 quoting ref no W.G. 972.

## Computer Appointments

**IF YOU HAVE REAL TIME EXPERIENCE  
MAKE A FRESH START IN 1978!**

**SOFTWARE ENGINEERS CIRCA £6,000**  
**SYSTEMS PROGRAMMERS CIRCA £4,000**  
**ENGINEER PROGRAMMERS CIRCA £4,000**  
**LONDON AREA**

OUR CLIENT, A LEADING ELECTRONICS COMPANY WITH GLOBAL INTERESTS IS SEEKING PROFESSIONALS TO TAKE PART IN A MULTI-MILLION POUND PROJECT OF THE FUTURE.

**SOFTWARE ENGINEERS** — Preferably graduates in electronic engineering, with a sound knowledge of hardware and experience of writing software, probably in ASSEMBLER.

**SYSTEMS PROGRAMMERS** — Recent graduates in electronic engineering, they will have one or two years' systems experience.

**ENGINEER PROGRAMMERS** — Recent graduates in electronic engineering and conversant with hardware, they should have one or two years' programming experience.

IF YOU ARE INTERESTED RING JOHN FARGHER FOR AN INFORMAL DISCUSSION ON 01-439 6299

## Computer Appointments

Regent House, 54-62 Regent Street, London W1A 4YJ. Tel: 01-439 6299

a division of Graduate Appointments Ltd.

## OPERATIONAL RESEARCH IN GOVERNMENT

**Head of New Computer Unit**

A new computer unit is being set up in Whitehall to give advice to operational research groups in the Civil Service Department and the Treasury tackling management problems which range from manpower planning to policy on public expenditure. The unit will advise OR scientists on the computing aspects of their work, and provide systems, programming and operating expertise.

Three appointments are to be made, the head of the unit and two programmers, one of whom will assist with systems design and one who will liaise with computer service bureaux. There are prospects of promotion at each level and a non-contractuary pension scheme. Starting salary will depend on qualifications.

**SCIENTIFIC PROGRAMMER** (Ref: SB/6/CB) Candidates (normally aged under 27) must have a good honours degree, or equivalent, in a scientific/engineering subject, and at least 2 years' appropriate post-graduate experience. They must have a knowledge of several programming languages and ability in systems design. Appointment as Higher Scientific Officer: £4230-£5440.

**HEAD OF UNIT** (Ref: SB/5/CB) Candidates (normally aged under 32) must have a good honours degree, or equivalent, in a scientific/engineering subject. They must have at least 4 years' appropriate post-graduate experience and a wide appreciation of scientific programming.

Some knowledge of OR is required. Appointment as Senior Scientific Officer: £5170-£6750.

**Systems/Scientific Programmers****SYSTEMS PROGRAMMER**

(Ref: SB/6/CB) Candidates (normally aged under 30) must have a good honours degree, or equivalent, in a scientific/engineering subject, and at least 2 years' appropriate post-graduate experience. They must have a knowledge of several programming languages and ability in systems design. Appointment as Higher Scientific Officer: £4230-£5440.

**SCIENTIFIC PROGRAMMER** (Ref: SB/7/CB) Candidates (normally aged under 27) must have a good honours degree, or equivalent, in a scientific/engineering subject and a knowledge of several programming languages. Appointment as Scientific Officer: £3070-£4510.

For further details and an application form (to be returned by 19 December 1977) write to Civil Service Commission, Alencon Link, Basingstoke, Hants RG21 1JB, or telephone Basingstoke (0260) 65551 (answering service operates outside office hours).

Please write or telephone for an application form to Bruce Stirling-Hamilton, Senior Personnel Officer, Seismograph Service (England) Limited, Holwood, Keston, Kent BR2 8HD. Tel: Peterborough (Kent) 83385. Applications are invited from men and women.

Please quote appropriate reference.

**Computer Operators**

(Shift Leaders Designate)  
Keston, Kent

Seismograph Service is a geophysical contractor, heavily involved in the search for oil, gas and minerals. Our Well Survey Division, which has been in existence over the past 3 years, uses mini computers to process geophysical data obtained from wells throughout the world. Currently we are looking for Computer Operators who have the potential to become Shift Leaders.

The ideal candidates will have, apart from experience of operation in a scientific environment, 'O' level in Maths and/or Physics, and ideally a degree. Benefits are in line with a modern progressive company and include a pension and social club and subsidised staff restaurant.

Please write or telephone for an application form to Bruce Stirling-Hamilton, Senior Personnel Officer, Seismograph Service (England) Limited, Holwood, Keston, Kent BR2 8HD. Tel: Peterborough (Kent) 83385. Applications are invited from men and women.

Please quote appropriate reference.

**System Software Controller**

There is a vacancy at the Harwell Laboratory for a System Software Controller who will be responsible for the installation and maintenance of the system software of an IBM 370/168 computer. He or she will be concerned with the generation of operating system software and the control and testing of additions and changes to the software.

Applicants should have had experience of multi-programming operating systems, and those with a knowledge of MVS will have an advantage.

Alternatively, a working background of computer operations in the widest sense, with practical knowledge of systems software, could be acceptable.

Starting salary will be according to age and qualifications within the scale £2020 per annum at age 18 to £3185 pa at age 29 (highest starting pay), rising by annual increments to £3930. Pay supplements of £313.20 and of 5% of salary (subject to a maximum of £208.80 pa) are additional.

Phone or write for an application form to: Personnel Department: 'B' A.E.R.E., Harwell, Didcot, Oxon OX11 0RA. Tel: Abingdon 24141 (STD 0238) Ext. 2059.

**HARWELL**

To apply for any of the above positions or for further information, please telephone the Consultant concerned during working hours on 01-242 9356, or write to the above address. If it would be more convenient to telephone in the evening, the telephone numbers are: Neville John — Farnborough (Kent) (66) 52017. Renée Nutt — 01-874 6372. Sharon Matthews — Billericay (02774) 22351. Sandy Lloyd — 01-891 5168

**SYSTEMS MANAGER**

Basildon, Essex

c. £6,500

Firthland International is a rapidly expanding British company specialising in the supply of pipe-fittings to the petrochemical and offshore industry. It currently operates a Honeywell 61/60 installation.

Responsible to the Financial Director, the Systems Manager will recommend the resources required to meet the Company's systems needs, develop and maintain all corporate systems, provide appropriate computer programmes and supervise the operation of the D.P. facilities.

Probably in late twenties, the Manager (male/female) will have a depth of experience in all aspects of D.P. and at least 4 years experience of programming in Cobol.

If you are ready to accept a responsible appointment demanding a high degree of initiative and drive telephone or write to John Houltman for further information.

Kearney Management Consultants  
134 Piccadilly, London W1V 9EJ  
Tel: 01 499 7181

**CAPITAL APPTS.****GRADUATES**Urgently required for trainee positions:  
Industrial, Commercial,  
Situations c. £13,000

ALL AREAS

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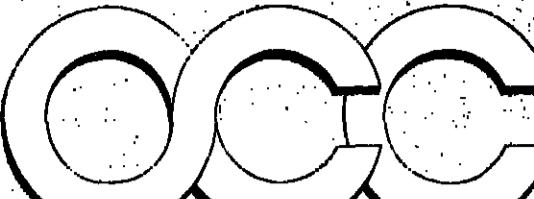
Members of  
Computing  
Services  
Association

**COBOL PROGRAMMER****TRAINEE ANALYST**

Leeds, £3,500 - £4,500

The Well Group's five steel foundries are served by a Data Processing Unit in Leeds where there are two vacancies for experienced COBOL Programmers. The successful applicants will join a small team working with a Burroughs 817/26, and on-line applications are envisaged for 1978. One of the positions will be filled by a programmer wishing to transfer to systems work within a few months.

Starting salary is negotiable and depends with relevant experience is available. Applicants should send personal and career details to J. S. Wilkin, Divisional Personnel Manager, Calton & Company Limited, P.O. Box 28, Leeds, S1 1JG.

**OCC computer personnel limited****West London****Salesmen (Male or Female)**

Earnings £6-£10,000 p.a.

Our client is a thriving computer bureau, needing more salesmen in order to fully exploit the buoyant marketing situation which now presents itself. A new service based on intelligent terminals has recently been introduced, and this is being well received by the market.

Candidates must have sufficient systems and programming knowledge to understand the technical content of the bureau service, and must already be experienced salesmen. Ideally they will already have sold for a bureau, or have had experience in selling for a computer manufacturer. The sales area to be covered is in South London and Southern Home Counties.

Ref: 632CW / Neville John

**London****Consultants & Programmers**

£4,000-£7,500

SYSTEM TEN &amp; SYSTEM 1500

Excellent opportunities exist with an expanding software house for experienced ICL SYSTEM TEN or SYSTEM 1500 personnel. Various Real Time projects, based in London and other UK sites, include a Building Society and a Hospital application as well as a software development project for communication systems network. The positions are based in West London or Reading. Opportunities to work on overseas projects also exist.

We are interested in ASSEMBLER programmers with several years experience, including a minimum of one year on SYSTEM TEN and/or SYSTEM 1500. We will also consider applicants with only two years' experience in COBOL and ASSEMBLER on other machines.

Senior candidates should have been involved in the successful implementation of a number of projects and must be able to assume a supervisory function as Project Manager or Team Leader.

Ref: 584CW / Renée Nutt

Salaries in excess of the maximum quoted above are negotiable for exceptional candidates able to justify higher salary expectation

**Reading****Senior Operator****Team/Shift Leader**

£3,000-£5,000 + s.a.

Our client is a Software House with a well-established UK and Overseas market. Immediate vacancies exist in READING at a Computer Centre housing a number of ICL mainframe installations which provide a machine time service. Candidates should be experienced 1900 George 3 operators who ideally will also have had some experience of supervising operations staff. We would be particularly interested in applications from senior operators with a minimum of 30 months experience who are seeking a team leader position. Alternatively operators with at least 18 months' relevant experience, in addition to a potential ability to lead a small group, may wish to apply for senior operator positions.

The starting salary will be negotiable and depend on previous experience. A three shift, 5-day week system is involved for which a 20% shift allowance will be paid on top of the salary. These vacancies offer an opportunity to join a rapidly expanding organisation.

Ref: 102CW / Sandy Lloyd

**Minis & Micros****Analysts & Programmers**

£4,000-£6,500

Opportunities with Consultancies &amp; Software Houses

We have a continuing requirement for Analysts and Programmers with a minimum of 1 year's real-time mini and/or microprocessor experience who are interested in joining a Consultancy or Software House organisation. Vacancies exist at all levels and provide the opportunity to gain experience on many different types of hardware. Applications areas are varied, covering commercial, financial, industrial, scientific, military and process control, as well as basic software development and enhancement. Positions are mainly based in the South East, many also offering the opportunity of short and long-term overseas assignments.

Of particular interest is assembler experience on PDP-11, Nova Hewlett-Packard, Honeywell Series 16, Intel or Computer Automation hardware, but any Real-time mini or micro experience would also be of interest. Preference is for a good academic background and for many positions some mobility could be required. Salaries in excess of the figures quoted could be negotiated for exceptionally well qualified applicants.

Ref: 3011CW / Sharon Matthews

## MERSEYSIDE

### SYSTEMS/PROGRAMMING/TRAINING OPPORTUNITIES

Due to a planned program of expansion, our Clients, a well established and respected Computer Services Company seek additional computer professionals to join their young dynamic department.

#### SYSTEMS & PROGRAMMING MANAGER Salary:- c. £6,000

The ideal applicant should have a thorough grounding in systems and programming, preferably gained on a minimum of 2 manufacturers hardware. He/she will take responsibility for supervising the systems and programming department and participate in pre sales support, quotations and technical troubleshooting.

#### SYSTEMS ANALYSTS

For this position our clients require systems analysts with a minimum of 3 years' data processing experience preferably gained on more than one manufacturer's equipment. The successful candidates should be well versed in commercial computing techniques and be flexible enough to tackle a wide variety of projects.

#### PROGRAMMERS

Programmers with a minimum of 3 years' experience, preferably with more than one commercial manufacturer, are required by our clients. The work will be of a project orientated nature and cover a wide variety of applications.

#### TRAINING/LECTURING POSITIONS

Our Clients also seek a systems analyst and a person with an operations and programming background to assist in the development and presentation of formal training courses, primarily to new recruits entering the industry but also advanced courses to experienced students.

Excellent terms and conditions of employment apply, including a pension plus the excitement of working for a fast growing young company. Re-location expenses by negotiation.

Initial interviews will be held in either Liverpool or Manchester.

CONTACT: David Wade on 081-833 0878

Salary:- c. £4,750

REF. NO. CW/11/28

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**SCR**



ICI HOLLAND BV, a subsidiary of ICI Ltd., produces and sells, among others, raw materials and intermediates for plastics and man made fibres. These are used for the manufacture of photo-film, clothing, plastic bags, furnishing fabrics and many other products. Well-known brandnames of ICI include: 'Perepex', 'Melex' and 'Terylene'. The modern plants are situated near Rozenburg/Europoort. The sales office for all ICI products is on the WIJNhaven in Rotterdam.

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The ICI European Computing Centre is situated in Rozenburg. In that centre a team of system programmers is working.

They occupy themselves with:

- generation and maintenance of system software necessary for the IBM 370/158 computer operating under SVS and HASP 4
- generation and maintenance of IMS,DB/DC
- preparation of MVS operating system
- development of standard software (utilities)
- support of an extensive RJE and Real Time Network
- advising the internationally operating developing teams.

The amount of work is large and expansion of the team of system programmers is very urgent.

The new programmer must have:

- higher professional education
- a very good command of the English language
- experience in one or more of the above fields.

Please write application with full details to:  
ICI HOLLAND B.V., Postbus 1020, Rozenburg, Holland.  
On top of your letter please mention the code CW/R77-46.

## Computer Studies/ Automations Specialist

### Viking Gas Terminal-Lincolnshire

Conoco Limited, part of the international oil and energy group Continental Oil, wish to appoint an Automations Supervisor. Candidates should be capable of co-ordinating the activities of the hardware and software sections of the automations group in the provision of a communication, automation and administrative service to other functions in the Viking Natural Gas Operation.

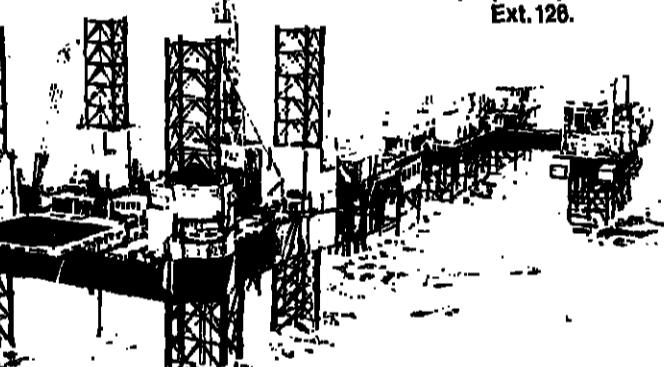
The work will involve the review of computer application, both onshore and offshore, in the Viking Organisation to maintain and improve current systems of operation. This will also entail the scheduling and co-ordination of installation and maintenance of automation hardware, including computer telemetry and communications. Some programming/analysis work is involved and user liaison activity forms a significant part of the responsibilities.

The ideal candidate, male or female, will be aged 28-40, possess an advanced qualification in computer studies, or have undertaken a technical apprenticeship with considerable computer exposure. He or she will have 7+ years experience, at least 2 of which should have been in a supervisory role as project team leader. Experience of process control is essential (preferably in a real time environment) and of project work, from conception to implementation, is desirable. FORTRAN experience, and a second language (preferably ASSEMBLER) ideally using Hewlett Packard equipment and exposure to digital and analogue supervisory systems is essential.

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3

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Ref. BJ/12117.

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We are looking for an experienced Operations Supervisor/Controller, preferably with ICL 1900/2900 experience, who can also play a significant role in the further development of the installation. The key requirement is practical experience.

Please send a CV, write to telephone: Colin Shingleton, Cross Computer Group Ltd, Barn House, 20-22 Whibley Road, Wimbledon, SW19 1PA. Telephone: 01-947 7411 (daytime), 01-947 6533 (evening). 24-hour answering machine.

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This is an unusual opportunity to join a long-term project of outstanding interest at an early stage of development.

Applications should be addressed to:

Angela Chris, TSB Trust Company Limited,  
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Hants, SP11 1PG.

Applications should arrive no later than 2nd December, 1977.

**TSB**

Appointment	Salary Up To	Job	Requirements
<b>DATABASE SPECIALIST</b>	<b>£7500</b>	To lead Database Team (5) as the senior advisor / planner in this field at the installation, with responsibility for major on-line applications, using ICL 2980.	Upwards of six years' computing experience, including database design and implementation, plus leadership ability. (Ref. 716)
<b>SRN. SYSTEMS ANALYST</b>	<b>£6250</b>	Analysis work on major systems, including feasibility studies, proposals, implementation and user presentations, both ICL 1900 and 2980.	Upwards of five years' D.P. experience, including significant systems analysis and design, plus knowledge of ICL 2980.
<b>ASST. CHIEF PROGRAMMER</b>	<b>£6250</b>	To lead a team designing and implementing an on-line system on ICL 2980, from design through to implementation, using database facilities.	Upwards of four years' programming experience, ANY MAINFRAME, knowledge of a modern operating system, plus leadership ability. (Ref. 716)
<b>SOFTWARE PROGRAMMERS</b>	<b>£5200</b>	To work in small team of user facilities and support. ICL 2980, including changes to VME/B operating system, and MAC, TP and IDMS software.	2-3 years' programming experience on ANY MAINFRAME, including a large machine operating system and special purpose software. (Ref. 716)
<b>APPLICATIONS PROGRAMMERS</b>	<b>£5200</b>	To work initially on ICL 1900 in COBOL (possibly with some PL/I), under George II+, and to transfer in due course to COBOL on 2980. Applications include transaction processing and the use of databases.	2-3 years' programming experience, including initial COBOL, on ANY MAINFRAME. A working knowledge of PL/I would be valuable. (Ref. 716)

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The Regional Computer Centres provides computer services for Health Authorities in South East England dealing with everything from payroll to supplies to monitoring child health care, and employs about 150 people. The mainframe computer is an ICL 1904S (128K) with discs, tapes, printers, communications processor and associated peripherals.

For Systems Analysts the work involves going out frequently around the Region, meeting people, securing considerable knowledge of health service activities. After this fact finding stage you will often conduct feasibility studies then see the project through to implementation and monitor post implementation performance. If you have the ability there are avenues for progress to top level appointments.

For Programmers close liaison with your project team provides an added stimulus plus the interest of advanced programming techniques. There is opportunity for promotion to more senior grades or to Systems Analyst work.

A particularly interesting project which the Centre is undertaking is a joint experiment which concerns evaluating three major systems applications in Tunbridge Wells, Bromley as well as comparing the performances of two different manufacturers' equipment. Maybe your background makes you an ideal candidate to become one of the evaluation team.

To find out more, telephone or write for an application form.

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Candidates should preferably have some experience of Digital systems and a relevant technical qualification such as City & Guilds Telecommunications.

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## Holland

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THIS SERVICE IS COMPLETELY FREE TO ALL OUR CANDIDATES, PLEASE TELEPHONE PROMPTLY. Reference number CW/411/2.

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Men and women who can offer the experience and personal attributes we need are invited to write briefly, giving enough information to justify a preliminary interview, to:-

Clive Bate, Director of Management Services (MS28)  
Westminster City Council  
PO Box 240, Victoria Street, London, SW1E 8QP

Further details will be sent to invited applicants.

processing facilities are vital to support the Council's administration. A key part of your role will be to identify the organisation's computer requirements and to provide the technical capacity to meet them.

Many of the Council's activities are based on properties within its boundaries and a property information system, co-ordinating data used by several departments, is planned. This project will provide a challenging range of technical problems involving the use of terminals and data base techniques.

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CONTACT: DAVID WADE on 081-833 0676

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Computing Services Association

REF. NO CW11/2



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Computer Centre  
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(For Telecommunications and Quality Assurance)

Graphics  
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Programmer

The University of London Computer Centre is a regional computer centre which provides computing services to London Schools, Colleges, the Royal Holloway and Western Universities on Central Data 7800, 8800, 8400 and Cyber 72.

The Centre supports more than 50 remote batch terminals and is part of the University of London network. 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EMI Electronics Ltd, have a vacancy at their Research Laboratory at Weston-super-Mare for a Senior Programmer.

The successful applicant will join a small program development team operating on GEC 900 series and 4080 computers and providing comprehensive computer programs. The job entails data acquisition, processing, analysis, documentation and mathematical support.

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For further information and an application form telephone 01-685 2169, ext. 464, or write to: The Personnel Officer, The Hatfield Polytechnic, P.O. Box 109, Hatfield, Hertfordshire AL10 8AB.

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Up to £4,800 p.a. plus 37% shift allowance  
Chester

We are looking for experienced computer operators for our IBM 370/146 Model 3 which runs under OS/VSE and supports CICS/VSE, RTAM, ATMS/STARS and VSE/VS2. We are also running D.O.S. under a D.O.S. Emulator. The T.P. Network has 8 remote users with 30 terminals and there are another 17 terminals within Computing Services.

The computer operates 24 hours per day every day of the year including all weekends and Bank holidays.

The operators work 12 hour alternating shifts with 3 days on and 3 days off.

Application forms are obtainable from Computing Services, County Treasury, Cheshire County Council, County Hall, Chester CH1 1BG Tel: Chester 602138, reference CS8/3/MW.

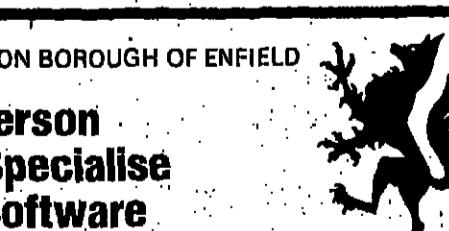
### LONDON BOROUGH OF ENFIELD

## A Person to Specialise in Software

£5,494-£6,055

Applications are invited for this post in the Borough Treasurer's Department. The successful applicant will be responsible for advising on and implementing software in addition to supervising programming standards. The Borough's computer installation currently consists of a 30K ICL 1902T and is developing a terminal system.

An application form is obtainable, upon receipt of a deposit, from the Borough Treasurer, P.O. Box 64, Clivis Centre, Silver Street, Enfield, EN1 3XF, closing date the 2nd December, 1977. Please quote reference ORA/4.



Associated Container Transportation Services Ltd. is a consortium representing five major British shipping companies and provides a wide range of specialist services connected with container shipping throughout the UK and the Continent.

At our Southampton Head Office we currently have a Honeywell 20/60 and a Burroughs 2700 machine and in April next year will be installing a B6700 with an on-line data base communications network.

Due to internal promotion we now require an operator, male or female, with one or two years' experience of Burroughs machines, preferably B6700, to work on a two shift basis: 08.00-16.00 and 15.30-23.30.

Salary will be up to £3484 per annum, depending on experience, plus 12½% shift allowance. fringe benefits include 4½ weeks' four weeks' holiday, contributory pension and personal sickness and accident schemes.

Please write or telephone for an application form to Mrs. J. A. Chandler, Assistant Personnel Officer, ACT Services Limited, Richmond House, Terminus Terrace, Southampton SO4 3SS ext. 3305.

With experience in Basic for Accounting System Development Top salaries paid

Contact: Mr. M. Jones  
31a High Street  
Aldershot  
Hampshire  
Telephone: 0252 316739

For a hardware manufacturer where salesmen are typically paid more and expected to achieve more, the total figure might be around £30,000.

## THE SALES BIT

### Beware this type of salesman

The first thing to ask yourself is, why should a successful salesman want to leave his present job to come and work with your company for a similar income package to the one he already has? After all, if he's a winner his present employer will be anxious to keep him.

From the salesman's point of view, change demands careful consideration of the financial implications of the "commission trough" and also the risk of not really knowing how near to the truth is the rosy picture his prospective employer has painted. Then there's the people bit. Will he fit into the establishment of another company?

Then, of course, there are "futures" to be considered. Can he be assured that his new employer is still going to be in business this time next year?

There is so much insecurity in the process of changing jobs that a successful salesman needs to have very positive reasons for doing so. Undoubtedly the most common reason why salesmen change their jobs is because their sales manager has suggested that it might be a good idea!

That is one type, but of course many salesmen seek a change of company for completely valid reasons. The most common justifications are ineffective sales and company management, inadequate product marketing strategy, lack of ongoing product development, unsatisfactory rewards, career limitations, and unfortunate personal relationships.

The hallmark of the effective recruiter of salesmen is his ability to quantify the credibility of the apparently justifiable reasons that come from all salesmen seeking to change their jobs, accurately placing them in one of these two categories, and then taking the appropriate constructive action.

To do this efficiently, the interviewer must have significant expertise in sales management and selling rather than simply being a professional interrogator. Otherwise, he will fail to identify the subtleties of candidates' reactions to well-considered sales and marketing questions, and be deprived of the benefit of that "gut feeling" of experience which is always more reliable than face-value.

If you must decide to offer a job to a candidate, be sure to agree pertinent referees and follow them up. If you can take up some additional references of your own, so much the better.

If you must recruit experienced salesmen rather than growing your own from the trainee level, then still look on them as trainees, starting at a higher level. Do they look like a good ongoing investment? Do you have the resources to exploit their real potential and cover for their inadequacies? Will they fit into your existing team? If the answer to any of these questions is no, then you shouldn't be offering them a job.

## TRADER

### Puzzle answer

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